

# **DELIVERY SYSTEMS—ASIAN EXPERIENCE**

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# DELIVERY SYSTEMS

## ASIAN EXPERIENCE

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*Editors*

P.R. DUBHASHI AND JAIDEEP SINGH



COMMITTEE ON CASE STUDIES

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*In Appreciation of  
EROPA's Role in Promoting  
Asian Cooperation in Public Administration*

## FOREWORD

In India, the initiative to encourage the production of administrative case studies in order to generate an empirical research base for enriching the training and education of public administrators was taken by the Indian Institute of Public Administration in 1961. The present publication, entitled : *Delivery Systems—Asian Experience* edited by Dr. P. R. Dubhashi, former Director, IIPA and Prof. Jaideep Singh, Professor of Behavioural Sciences, IIPA, represents a significant development in the area of case studies. It is distinguished from our earlier twelve volumes of case studies by its focus on the experience of other countries in the Asia-Pacific region and includes administrative case studies from Philippines, Indonesia, Thailand, Pakistan, South Korea and Japan. In addition, the editors have provided an excellent overview article which outlines twenty basic points for improving the performance of delivery systems in development sectors in Asia.

I am hopeful that the coming decades will witness the creation of much stronger cooperation for development among the countries of the Asia-Pacific region. Comparative empirical research work like the present investigation into the nature of administrative delivery systems in various development sectors in seven countries of the Asia-Pacific region will cumulatively become a powerful force for accelerating the progress of each nation in the mission to facilitate a superior, a more harmonious, prosperous and just quality of life to its citizens and for bringing into fruition the kind of knowledge and cooperation that humanity requires for increasing the possibilities for global synergy.

S. RAMANATHAN

*Director*

NEW DELHI  
FEBRUARY 2, 1987

INDIAN INSTITUTE OF  
PUBLIC ADMINISTRATION

## PREFACE AND ACKNOWLEDGEMENTS

The present volume is a small contribution of the Indian Institute of Public Administration in its role as a centre of the Eastern Regional Organization for Public Administration (EROPA). With this publication, the IIPA through its Case Studies Programme started in 1961 will have published thirteen volumes—four in its old series and now nine in its new series—comprising a total of eightyfive case studies dealing with various facets and dimensions of public administration. We believe that these case studies represent a rich resource for understanding public administration—its institutions, systems, processes and practices, for pointing out the directions for the transformation of the psychology and behaviour of public administrators, for the development of the discipline of public administration and enrichment of the quality of teaching and research, and in general, for the evolution of a more empirical science and a more synergic, humanistic and responsive art of public administration. We look forward to fuller and more fruitful utilisation of these case studies.

The project of preparing the present volume consisting of case studies on delivery systems in various development sectors in Asian countries was taken up over four years ago. From the inception of the idea and throughout the process of the collection of these case studies, Prof. Raul P. de Guzman, Secretary-General, Eastern Regional Organization for Public Administration, has been extremely helpful in facilitating our effort and we are deeply indebted to him for his keen interest and active support.

The chairman of IIPA's Committee on Case Studies, Prof. M.V. Mathur, has provided leadership to IIPA's Case Study Programme right from its commencement. He has been a continuous source of encouragement and guidance to us and we wish to express our deep sense of appreciation and obligation to him.

We would also like to take this opportunity to express our sincere appreciation and thanks to Shri M.K. Gaur,

Assistant Editor, IIPA and Shri Om Anand, Publication Officer, and the other members of the excellent staff of IIPA's Publications Section for their effort and significant contribution in ensuring the quality of this publication.

Finally, we wish to express our appreciation to Shri G.C. Tandon for his secretarial assistance throughout the duration of this project and to Shri J.N. Chawla and Smt. S. Chacko for their assistance with the typing of the final manuscript.

JANUARY, 1987

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## DELIVERY SYSTEMS IN DEVELOPMENT SECTORS IN ASIA—AN OVERVIEW

P.R. DUBHASHI AND JAIDEEP SINGH

It is being increasingly recognised that the success of the development effort critically depends on the efficacy of the delivery system. If the delivery system is weak, the objectives of the development programme would not be achieved since the benefits of development would not reach those for whom they are intended. It is, therefore, appropriate that the delivery system should receive attention of the development administrators as well as the leaders of the development process.

The scope of the delivery system is continuously expanding in response to the revolution of rising expectations. The evolution is two-fold. It is both in relation to the increasing range of services required by the people as also the expectation that these services would be provided by government in the context of the concept of welfare state. Thus, the services that have to be delivered are not only the traditional services such as dispensation of justice or protection of the citizen from disturbances or law and order. They cover a whole range of development services such as those needed by the citizens in general in the field of health and education, those particularly needed by the urban citizens such as transportation and housing, and those needed by the farmers such as agriculture extension and the supply of agriculture inputs.

Along with the widening scope of services to be delivered is the lengthening line of delivery. Services are expected to be delivered not only in the urban centres or central places in rural areas but in the remotest corners of the country. This increases the distance between the traditional sources of supply of services which are often based in the central places and the point of delivery or the receiving of the services by

the distant citizen-consumer. Not only is the line lengthening, often more than one channel of delivery has to be provided, and for dealing with the various channels of delivery of services a number of agencies come into the picture creating the need for coordination.

A Central agency, however large or competent, cannot deliver the services to the people in the remotest corners of the country and hence there is a need for locating agencies delivering the services at the grassroot level itself. Hence the need for decentralisation. But between the central agency and the grassroot agency there is a very large distance which creates the need for intermediate agencies to provide links in the chain of delivery.

The decentralisation takes place either through deconcentration of administration by creating field agencies or through devolution of functions to autonomous local agencies called local self-government institutions. Often the process of decentralisation of the administrative agencies and the political devolution to self-governing institutions need to be brought together. One way of doing it is to make the local administrative agencies responsible to the local government institutions.

Decentralisation, however, does not necessarily imply efficient delivery of services. The local government institutions are often weak both in terms of financial and manpower resources. The Central Government, therefore, has to find out ways of transferring financial resources to the local institutions. This, however, is often a slow and painful process since the Central agencies are reluctant to pass on the resources to local agencies. The local government legislation often does not devolve suitable sources of revenue to the local agencies which are dependent on grants from the Central Government which also often do not come in liberal measure. However, as in Sri Lanka, radical measures are sometimes taken in terms of a concept like that of a district budget with revenues earmarked for the local development efforts so that local agencies do not have to wait for the grants from sectoral departments at higher levels.

Manpower is even a bigger problem since the local agencies cannot afford to pay high salaries and give promotional

opportunities and therefore they are unable to attract suitable manpower from the employment market. Hence often the personnel are deputed by the Central agencies to the local agencies. But the Central officers are often reluctant to go on deputation to the local agencies because Central jobs are considered to be more prestigious than the local jobs. Besides there is a clear physical question of advantages of location. Facilities, whether of education or health or general level of living, are far better in the cities than in the countryside, and therefore, there is reluctance on the part of personnel whether doctors or teachers or development workers to work in remote areas in the interior.

An alternative to delivery services by government or local agencies is that by private agencies. In view of the unsatisfactory delivery by governmental agencies, it is often thought that the government could rather encourage private agencies to deliver services in rural areas. But the reluctance to serve in rural areas is not confined to government agencies alone. It also extends to private agencies. Just as government personnel are reluctant to work in the interior rural areas so are also the employees or owners of private agencies.

The delivery of even a single service often requires the participation of several agencies—various departments of the Central and state governments, local agencies, semi-governmental agencies and private institutions. It is extremely important that these agencies do not work at cross purposes and that all their efforts are imbued with the same goal in view—rendering satisfactory services to the common man in the remote areas. There is, therefore, the need for coordination—vertical coordination right down to the grassroots level and horizontal coordination between agencies and departments working at the same level, local agencies, quasi government institutions as well as the private agencies. There is also the need for functional coordination between planning, financing, staffing, execution, monitoring and evaluation. Even if one of the functions is not properly discharged, there may be failure in the effective delivery of services.

Finally, the effectiveness of delivery does not depend on the delivery system alone. There is also the receiving end. There should be some way by which the citizens to whom

the services are to be delivered are able to receive the benefits of these services. These people at the receiving end are often unorganised, inarticulate and even ignorant of the services which they are entitled to get. Taking advantage of their weaknesses, vested interests often side-track them and corner the benefits for themselves. It therefore becomes necessary to organise the receivers of services in terms of groups which can then establish their rapport with the administration in-charge of the delivery services.

The present volume entitled *Delivery Systems—Asian Experience* consists of seven case studies from seven Asian countries. The first three deal with the delivery of social services—one each with primary health care, family planning and non-formal education respectively. The other four case studies deal with the delivery of services in the agricultural sector, one each with hybrid seeds, irrigation water through tubewells, fertiliser and credit. Each of these case studies provides information and highlights concepts, principles and practices which are useful for improving the efficiency, responsiveness, acceptance and overall effectiveness of the particular delivery system in question and also, for delivery systems in various development sectors in general.

The first case study deals with the planning and implementation of the primary health care programme in the Philippines. The fundamental problem in the delivery of health care is how to extend the best possible health service to the maximum number of the population and how to bridge the gap between the adequacy of service in the urban and rural communities. A pilot test of the programme was done in twelve selected provinces, one for each of the twelve regions of the country. Analysis of the involvement of all levels of government—Central, regional, provincial, municipal and barangay (village)—of sectoral agencies in addition to the Ministry of Health and of private organisations and the involvement of the community are brought out in the study. The factors that facilitated or impeded the effectiveness of the delivery system in each of the pilot areas are examined. The key problems in the implementation of the primary health care approach are grouped into the following five categories: problem of coordination and complementation of agencies

and institutions involved; logistics—lack of funds and competent and motivated personnel; problem of adequate community participation and the need for greater involvement of non-governmental organisations; project management problems such as inadequate monitoring and communication; and, miscellaneous factors such as politics, lack of committed field level workers and the need for reorientation of attitudes and behaviour of the recipients. The author suggests a bottom-up approach for improving the motivation and co-ordination of efforts and thus creating a superior delivery system. Such an approach would make development of the community the rallying point and primary health care a means to achieve the superordinate goal of community development. The present situation in which the community and agencies are being rallied to the cause of primary health care makes agencies experience themselves as being used for the achievement of the objectives of the Ministry of Health and thus reluctant to cooperate.

The second case study analyses the delivery system for family planning programmes in Indonesia. While in most developing countries, the major responsibility for programme planning and implementation lies with the Ministry of Health/Public Health, in Indonesia the responsibility is with a co-ordinating council called the National Family Planning Co-ordinating Board (NFPCB). The NFPCB's responsibility is for programme policy, planning, coordination, supervision and education in all aspects of the national family planning programme. In its operation, the NFPCB is supported by its branch offices at the provincial level along with other organisations and agencies known as Implementing Units such as the Departments of Health, Social Affairs, Education and Culture, Information, Home Affairs, Religious Affairs and various private organisations as well as formal and informal leaders (especially religious leaders), the provincial governors and other administrators. The responsibility of translating family planning policies and plans into action lies in the implementing units. The main problem of organisation is weakness in relationship and communication between the NFPCB and the implementing units at the Central and local levels. This is due to the weak administrative component of

the NFPCB's organisation for carrying out the necessary coordination. Various steps have been taken to reduce these dysfunctionalities.

The success of the family planning programme also depends greatly on the adequacy of the delivery facilities, such as the family planning clinics, village contraceptive distribution centres and many other institutions. Eighty per cent of the family planning services are being delivered by the facilities and personnel of the Department of Health's Maternal and Child Health services. Three serious constraints *vis-a-vis* improvement of these services are: (a) the shortage of midwives, (b) inadequate building facilities, and (c) inadequate bed facilities for maternity services. The author concludes with the overall appraisal that the crucial elements for the successful implementation of the family planning programme are financing and budgeting which determine the volume of material and human resources available for programme implementation and the level of motivation, skill and knowledge of family planning workers and staff members. Particularly emphasised is the critical unresolved problem of low incentives for field workers in the family planning programmes in the rural areas.

The third case study deals with the challenge of eradication of illiteracy in Thailand, *i.e.*, to assist the illiterate poor from both the urban and rural areas to get out of the darkness, imprisonment and exploitative bondage of illiteracy into the light, freedom and dignity of literacy. The task is formidable because lack of education and poverty go together—the uneducated are poor, the poor are uneducated. The problem is particularly serious in the rural areas and even more so, in the more backward and more remote rural areas, in the areas of absolute poverty. By 1981, the Thai Government had developed the non-formal education pilot projects for the purpose of operationalising a new policy which focused on the development of poverty concentration areas.

For the purpose of policy formulation and coordination at the apex level is the Office of the Prime Minister. At the next level, integrated cooperation is required among four key ministries, *i.e.*, the Ministry of Education, Ministry of Interior, Ministry of Agriculture and Cooperatives and the

Ministry of Health. However, though plans are well defined integration in implementation does not take place according to plan due to the nature of governmental bureaucracy. The tradition of isolated functioning and rigid boundaries arising from and further reinforcing a compartmentalised/segmentalist perspective and style of operation makes inter-ministerial coordination, let alone cooperation and integration, very difficult. Much more thought and effort will have to be given in the coming years to prevent the losses due to wasteful fragmentation and sub-optimal utilisation of collective resources—human and non-human—and to meeting the challenge of creating a holistic, mutually supportive, synergic delivery system particularly, at the district, sub-district, commune and village levels. The author outlines some of the integrative committees that have been created to facilitate this process.

*Vis-a-vis* the other typical problem of limited human resources, this is seen as, in essence, the problem of low motivation. The reward structures of governmental organisations will have to be greatly modified and field jobs like delivering education in the remote areas will have to be given their rightful share of importance. If the way to professional and financial advancement comes more through contact with the boss in the headquarters/Central offices, then the motivation for the truly significant development tasks in the communes and villages will, by and large, just not get created. Present day administrative delivery systems have to radically transform their basic philosophy and reward structures if they really mean business when they talk of serving the people and, more so, the poor.

The author concludes the case study by making some specific recommendations for improving the effectiveness of the administrative delivery system for non-formal education and for increasing its power to function as a catalytic institution and thus multiply substantially its overall impact on the elimination of the remnants of the scourge of illiteracy from the face of Thailand.

The fourth case study deals with the delivery system for hybrid seeds production in the state of Maharashtra in India. During the years 1965-68, India embarked on dramatic

expansion of its programme for the production and utilisation of hybrid seeds to increase its agricultural production. This was the beginning of the Green Revolution. This case depicts the manner in which one state, *i.e.*, Maharashtra, planned and implemented during 1966 its programme for the production of high yielding seeds of jowar, maize and bajra. This programme was extremely successful. In fact, over seventy per cent of the total hybrid seed production in the country during 1966-67 was produced in Maharashtra.

The case provides considerable understanding of the complexity of the planning and coordination process—vertically from the Union and state government levels through the zilla parishad level to the level of the individual cultivator in the village and horizontally, with multiple organisations particularly, with the National Seeds Corporation.

Coordination of all the necessary inputs for the programme, *viz.*, foundation seed, fertiliser, insecticides, water, credit, trained staff in adequate numbers, access to technical guidance on many issues like land preparation, seed use, composition and dosage of fertilisers, pest control, irrigation and drainage, etc., and securing the cooperation of the cultivators was the multifaceted challenging task faced by the administrators of the programme.

The dedication, commitment and excellence of administrators and technical personnel in all the concerned organisations as well as the leadership role played by the chief minister in continuously setting high performance goals are especially highlighted by the case.

The case study provides insight into the administrative work required in the implementation of a major agricultural development programme. It highlights the complex process of planning, coordination, implementation, monitoring and review of a major developmental programme and the dedication and commitment of administrators, technical experts and political leaders.

The fifth case study consists of a techno-economic evaluation of the delivery of irrigation water through tubewells in a specific project in Pakistan. In 1965, 138 tubewells were installed in three types of canal commands, namely, perennial, non-perennial and uncommanded. The major part of the

project area covering 1,10,000 acres fell within perennial command. Also, the number of tubewells installed in the perennial command area far exceeded the combined total of tubewells in the non-perennial and uncommanded area. One tubewell in the perennial area was randomly selected for study. The case presents data over seventeen years (1965-82) on the performance of the tubewell, annual pumpage and percentage utilisation and its impact on cropping intensity and gross value of crop production. The advantages of the supplemental delivery system for irrigation water through tubewells are empirically demonstrated through data which depicts a dramatic increase in the gross value of production of crops as well as increase in the cropping intensity. The objectives of the delivery system were fulfilled to a much higher degree than the expectations at the project formulation stage.

The sixth case study deals with the delivery system for fertiliser in the Republic of Korea (South Korea). Fertiliser is one of the most important inputs for Korean farmers and since the ratio of expense on fertiliser to total agricultural production cost is high, government policies with regard to fertiliser have been a matter of great concern to farmers. Accordingly, the fertiliser policy and the delivery system for its implementation has been designed with much care on the principles that the use of fertiliser by farmers should be encouraged, that credit should be available, that the retail price should be low, stable and uniform throughout the country (thus facilitating consumption in remote rural areas) and that the balanced application of fertiliser should be promoted. The overall goal is that the nation should be self-sufficient in foodgrains. The case study highlights the historical changes in the delivery system for fertiliser since 1945. Also, the organisation and character of the delivery system is outlined along with its merits and weak points. The author concludes by indicating the directions for development of the delivery system in the coming years.

The last study deals with the delivery system for agricultural credit in Japan. The agricultural credit system is classified into three main channels of financing: financing from government funds, such as, the Agriculture, Forestry

and Fisheries Finance Corporation; financing from the savings of farm households and others, such as, the funds operated by the financing organisations affiliated with the system of agricultural cooperatives; and, financing from general funds, such as those of the commercial banks. The financing by organisations affiliated with the agricultural cooperatives is further classified into: loans to farm households, etc., from funds on which interest subsidies are given by the government or by local public bodies, such as those from the 'Agricultural Modernisation Funds' and the 'National Disaster Rehabilitation Funds', and loans to farm households, etc., offered by the agricultural cooperatives at their own expense, such as, the financing from the funds owned and operated by the agricultural cooperatives themselves. The study provides an overall perspective as well as details about the flow of agricultural credit from the various important channels of financing.

From an overview of the case studies in this volume and other similar studies, we are intensified in the conviction that certain basic propositions are valid, by and large, for improving the performance of delivery systems in development sectors in Asia:

1. The national level coordinating institution, ministry or agency, and the large number of interconnected, vertically and horizontally interrelated ministries, agencies, private organisations, voluntary bodies, community organisations and cooperatives should be imbued with the *superordinate goal of community development*.
2. Responsibilities should be clearly delegated down the line to the field formations and shared with all cooperating agencies, groups and individuals. (Needless to add, credit for carrying out the responsibilities must also be equitably shared—an essential, yet so often neglected practice.)
3. Extensive devolution of powers and radical decentralisation and delegation are concomitant, urgently needed ingredients for increasing the effectiveness of contemporary delivery systems.
4. Local self-governing institutions should be revitalised

and budgetary arrangements should provide for self reliance in financial resources.

5. Human resources—their competence and motivation particularly, the willingness to serve rather than dominate, and the willingness to work at the grassroot level—make the vital difference in the quality of the delivery system.
6. Institutional structures, systems, procedures and practices need radical transformation and streamlining. For example, the volume of paper work has to be brought down drastically.
7. Reward structures have to undergo a dramatic transformation with professional and financial advancement facilitated for those who work in the field particularly, in the remote and backward poverty concentration areas. Simultaneously, very high weightage (instead of the very low or even negative weightage at present) has to be given to the 'old fashioned' qualities of honesty and ethical conduct, courtesy and friendliness and innovation and entrepreneurial risk taking in the pursuit of delivering excellent service to the citizen.
8. Communication and information flow, horizontally, diagonally as well as up the hierarchy, have all to be greatly encouraged.
9. Linkage mechanisms for ongoing horizontal, diagonal and vertical coordination and cooperation within and between organisations have to be institutionalised to function frequently, regularly, and to a considerably high degree, in what might be called, 'brainstorming' fashion.
10. At every level, leadership that catalyses effort and cooperation and sets an example of integrity and performance is extremely significant. Particularly, higher levels of political and administrative leadership must set very high standards of ethics and excellence in performance and general conduct.
11. At all levels and *particularly for higher levels in all national and transnational institutions/organisations*, strong deterrents must be institutionalised to punish and prevent corrupt practices.

12. At every level, the traditional boss-subordinate relationship has to be radically altered towards a relationship of egalitarian partnership.
13. Relationships, specially informal relationships, among all members of each organisation, should be greatly encouraged.
14. The unlimited productive power of people for their own development is presently, more or less, completely untapped. The encouragement of citizens' associations and organisations, their participation in improving existing delivery systems and catalysation of their dormant, entrepreneurial capabilities for self-reliant development of new delivery systems are among the most important directions for the future. This implies, a revolutionary transformation of their self-image—that they are not 'passive recipients' or 'targeted beneficiaries' of what to them are inexplicable, enormously complex, confusing and unjust, alien and alienating delivery systems but rather, that they are the primary creators of their own destiny, that the primary force for raising their quality of life and consciousness—their physical, emotional, mental, social, political, economic, aesthetic, ethical and spiritual life—is not the state or some organisation 'out there' but their own inherent natural propulsion for synergic self-actualisation, their own unlimited powers and wealth of wisdom, energy, mutual love, sharing and cooperation. This awareness, that the so-called 'recipients'—the 'receiving systems' are the most powerful force for the reshaping and revitalisation of delivery systems should be enormously and constantly emphasised and urgently operationalised.
15. Quarterly, or even more frequent monitoring (instead of more or less none at present) of organisational and inter-organisational characteristics as perceived by samples of all members of the delivery-cum-reception systems should be institutionalised to provide continuous data for ceaseless innovation in the pursuit of more civilised, participative and egalitarian societies and an enlightened, humanistic community.

16. For excellence in performance of delivery systems, or rather, delivery-cum-reception systems, a 'million' things must be done right. On the contrary, one thing done wrong can lead to failure.
17. Failure, however, is the eternal companion of effort. As we are all aware, the scientific method is central to all innovation and progress. And this essentially means experimentation, *i.e.*, ceaseless trial and many an error. If we punish honest error then, sooner rather than later, all trial, *i.e.*, all effort for improvement will also cease. This is one of the major maladies of our contemporary bureaucratic delivery systems. A positive attitude to error, to failure in the genuine pursuit of perfection, must therefore, be appreciated, encouraged and openly and publicly positively reinforced again and again if we want the entrepreneurial courage to take risks in the mission to provide excellent service to the citizen—the courage to try and try and try again—to get internalised in every member of our organisations and institutionalised into radically transformed innovation nurturing organisations.
18. The above charter of directions for the improvement of administrative delivery systems may give the impression that a veritable revolution is required. Well, it is. And urgently. But how do we get started?
19. The first thing, the most important (yet most neglected) thing to do, is to ASK THE CITIZEN—get close to the citizens and request them to give us their perceptions of what we should do—and then act on the basis of this data while continuing to remain close to the citizens and their perceptions and guidance.
20. In the longer run, we must learn to trust, respect and value each individual—each member of our delivery-cum-reception systems, each member of our society and each member of the world community—to a much higher degree. Human dignity is the ultimate value—the purpose of all creativity and productivity. And synergically, the source of all creative activity and productivity is human dignity. □

# DELIVERY SYSTEM FOR PRIMARY HEALTH CARE (PHILIPPINES)

MILA A. REFORMA

Effective delivery of health services to the widest segment of the population is indisputably an important governmental activity. The adoption of measures to improve a nation's health not only means expenditures for services but in effect, amounts to an investment in human resources. The fundamental problem, however, in health care delivery in the Philippines is how to extend the best possible health service to the maximum number of the population and how to bridge the gap between the adequacy of medical care in the urban and in the rural communities.

Efforts to strengthen the rural health delivery system have been going on since 1954 with the enactment of Republic Act No. 1080. The thrust given to the rural health programme is tangibly spelled out in the different development plans formulated since then. Measures adopted to strengthen the delivery of health services to the rural areas include:

1. decentralisation of the health delivery function with the creation of more regional health offices;
2. extension of health services to the remote areas of the country through the primary care centres in the barrios as an administrative structure for total health care delivery;
3. recruitment of more non-doctor personnel (nurse/midwife/sanitary inspector) to make the agency responsive to the health needs of the population especially in the barrio;
4. strengthening and expansion of the rural health services through the creation of additional rural health units together with the personnel complement and clinic facilities;

5. redefinition and distribution of duties and responsibilities of RHU personnel to meet the increasing demands for their services through broadening of the functions of the non-medical personnel in the absence of the physicians;
6. a programme of rehabilitation and the provision of new buildings to improve rural health infrastructure; and
7. the fielding of underboard doctors and nurses to the rural areas under the Rural Health Practice Programme.

In spite of all these, the problem of inadequate medical manpower to undertake the delivery of basic health services in the rural areas still persists. Increase in population has not been met with a concomitant increase in resources allocated for health expenditures so that resources allocated for health have been severely lacking given the growing problems related to health care delivery.

Cognisant of the vital role of health in development and the constraints on resources available, the Philippine Government together with the governments of other developing nations have recently formally adopted the Primary Health Care approach in consonance with the Declaration made at Alma-Ata, USSR that primary health care is an important tool in the "attainment by all citizens of the world of a level of health that will permit them to lead a socially and economically productive life".

### PHILIPPINE COMMITMENT TO PHC

The Five-Year Philippine Development Plan 1978-1982 has adopted PHC as one tool to attain national development which has been focused at "rectifying the grave economic and social inequities that have accumulated".

Thus, on October 19, 1979, President Ferdinand E. Marcos issued Letter of Instruction No. 949 instructing the Minister of Health and all officials and personnel of the Ministry of Health to:

Design and develop and implement programmes which will:

- (a) Focus on health development at the community

level particularly in the rural areas by: (1) strengthening health care delivery at primary levels and immediate support systems at secondary levels; (2) developing a strong primary health care system in coordination/cooperation with all the ministries and agencies engaged in social, political and economic development; (3) lowering the cost of drugs; and (4) rotation and increase of medical service personnel.

- (b) Effectively utilise these systems in order to control or eradicate the immediate and specific health problems confronting the Filipino communities by: (1) strengthening and reorienting existing specific programmes in family planning, nutrition, malaria eradication, schistosomiasis control, cancer control, and others to conform to the thrust of the peripheral services; and (2) developing a plan to eradicate tuberculosis by means of a strong programme which will be integrated with the health development at community levels.
- (c) Redirecting and reorienting the organisation of all its agencies at the Central level so as to provide efficient and adequate administrative planning and other support services for health development by: (1) strengthening their staff functions and capabilities; and (2) strengthening their programme of activities.

Such is the country's commitment to the PHC that it was made an important component of the Population II Loan Agreement with the World Bank in 1979. The Population II Loan Programme is a P21 million loan to the Philippines designed to test PHC schemes in the Philippines through its implementation in 12 pilot provinces. Of the amount, P18 million was programmed as a revolving fund for the development of income-generating PHC projects. The remaining P3 million was programmed to be spent in 1984 for various PHC activities.

## OBJECTIVES OF THE CASE STUDIES

This case study is primarily an intensive study documenting and evaluating the processes leading to the adoption of the PHC approach by the Philippine Government and its implementation in selected provinces. Analysis of the involvement of all levels of government from the Centre to the barangay, and of sectoral agencies and local units in addition to the ministry is included in the study. More specifically, the study will examine the following:

1. The Programme Planning Process.
2. PHC Programme—Pilot Test.
3. Mechanisms of Coordination and Complementation (developed for PHC activities at various levels—Central, Regional, Provincial, Municipal, Barangay).
4. Social Preparation Activities.
5. Linkages with Other Agencies.
6. Manner in which PHC Policy is Translated into Projects/Policies by the Various Participating Agencies.
7. Extent of Reliance on Community Resources for Identifying and Resolving Health Development Issues.
8. Extent of Participation of Communities in Implementation of Projects.
9. Issues and Problems in the Implementation of PHC.

## THE PROGRAMME PLANNING PROCESS

### *Selection of Pilot Areas*

An initial activity in the implementation of the PHC programme was the selection of 12 provinces, one for each of the 12 regions of the country, and a number of municipalities where the PHC approach was to be applied on a pilot basis (See Annexure 1). The criteria laid down for the selection include the following :

1. the need for PHC as manifested by :

(a) low health personnel to population ratios;

- (b) absence of any province-wide PHC programme;  
and
  - (c) inaccessibility to the regional centre;
2. receptiveness of the local government;
  3. presence of a viable functional organisation for managing projects at the provincial and municipal level; and
  4. law and order situation.

### *Strategy Formulation*

Pursuant to the provision of LOI No. 949, the Ministry of Health developed the strategy for the implementation of the Primary Health Care programme in the country. The strategy developed has for its goal: "Health for all Filipinos by the year 2000." This goal provided the framework for action, a strategy which calls for "an active and continuing partnership among the communities, private and government agencies in health development".

The strategy defines the implications of the partnership for the community as follows:

- the need to establish or strengthen existing community organisations;
- the need to develop or strengthen leadership, planning, organisation and communication skills for health development;
- the need to allocate existing and generate new resources for health development; and
- the need to relate and coordinate effectively with government and other agencies in planning, implementing and monitoring health development activities.

The strategy proceeds to provide the implications of the partnership for government and private agencies as:

- the need to reorient health and related staff to facilitate and support community health development;
- the need to develop leadership and managerial skills among health and related workers;

- the need to strengthen intrasectoral and intersectoral coordination;
- the need to develop appropriate technology for health development;
- the need to strengthen the planning, organisation and communication process;
- the need for continuous monitoring and evaluation of health development; willingness to share limited resources with communities and other organisations in attaining shared objectives;
- the need to adopt an integrated orientation to health development (systemic and holistic); and
- the need to develop support mechanisms/processes to ensure viability and continuity of the partnership.

These implications and conditions for meeting the goal of health for all requires that the strategy be a slow but deliberate process. Thus, a twenty-year period for achieving the goal was provided. The strategy calls for the phasing of the process in three stages.

The first phase covering the period from 1981-85 focuses on "initiating health development activities and forming partnerships with a small number of selected communities adopting an intersectoral approach throughout the country." A target of 10 per cent of all barangays was set for initiating a partnership in health development for this phase. During this phase, a Human Resource Development Programme is also expected to be designed and implemented to support health workers by providing them with continuing education and training to meet the demands of their new roles. Finally, a national collaborating system for health development supportive of health and related sectors with technical support in the management of health development will be designed and established.

The second phase, covering the period from 1986-95 is seen as a period of major expansion of the partnership strategy to include at least 88 per cent of all barangays in the country. It is envisaged that during this period, modifications in the implementation plan might have to be made to further

strengthen existing support systems and mechanisms for inter-agency cooperation and coordination.

The third phase, covering the period 1996-2000 is envisaged to be a period of undertaking activities leading to the consolidation and maintenance of partnership relationships among communities, government agencies and private sector groups engaged in health development. At the end of the period, it is expected that all established barangays will have become full partners in attaining the goal of 'health for all'.

#### *Formulation of the Implementing Guidelines for Primary Health Care*

Guidelines for the implementation of the PHC programme were prepared and distributed to each of the Health offices in the pilot regions, provinces and municipalities. The guidelines specified the following:

1. the role of the Ministry of Health;
2. the organisation of the national, regional, provincial, municipal and barangay level Primary Health Care Committees;
3. the organisation of the national, regional, provincial and municipal Technical Working Groups;
4. social preparation strategies and activities at the various levels;
5. training of all those concerned with PHC implementation;
6. resources to be used: manpower, financial and physical facilities, equipment and supplies; and
7. monitoring and evaluation of the programme.

#### *Orientation and Training Workshops*

To provide knowledge and orient the would-be administrators and implementers on the concept of PHC, a series of seminars were conducted in Manila. In March 1980, provincial health officers of the pilot provinces convened in Manila for their orientation. In this seminar, selection of the pilot municipalities based on the criteria formulated was done. In August 1980, MHOs of the selected municipalities were brought together in a series of training workshops. The

## *Delivery System for Primary Health Care*

trained MHOs were required to organise three barangays in each of their respective municipalities where the PHC programme was to be piloted. The MHOs were also asked to identify residents in the barangay to be chosen by the community to be trained as Barangay Health Workers. These BHWs were to spearhead the implementation of the PHC approach in the barangays. Criteria were set for the selection of these workers.

### *Announcement of the Nation-wide Implementation of the PHC Approach*

While the PHC programme under the Population II Loan Agreement specified the piloting and phased strategy, the Ministry of Health issued a mandate specifying among others the involvement of all barangays in the PHC programme. All barangays were to be introduced to the concept of PHC and should subsequently develop PHC projects not later than 1985. This was to be implemented through the utilisation of 8,557 midwives of the RHUs. This expansion programme was to begin in June and it was targetted that all barangays should be organised for PHC implementation by September 11, 1982.

### PHC PROGRAMME—PILOT TEST

The Primary Health Care programme in the pilot areas of the regions appears to be gaining ground despite problems and other difficulties of implementation encountered by the lead agencies, Ministry of Health offices from the region down to the barangay level. Its state of implementation varies in the different regional, provincial, municipal and barangay levels. A brief account of the PHC implementation highlighting the salient features that facilitate or hinder the process of implementation is in order.

#### *Region I*

Social preparation activities and serious efforts to plan the implementation properly have been the emphasis of programme implementation in Region I. Despite efforts to organise a Regional Primary Health Care Committee, this remains to be

done yet. Issues on the concept of and need for an intersectoral committee for PHC have limited the activities done at the regional level.

Despite these issues raised at the regional level, PHC activities in the provincial, municipal and barangay levels have been carried out as part of their development activities. The PHC approach in the province has been integrated in the Pangasinan Integrated Area Development. Moreover, the Provincial Governor himself heads the Provincial Primary Health Care Committee. Similarly, at the municipal level, there has been a plan to integrate PHC. From the provincial down to the barangay levels, coordinating committees have already been organised but these committees have yet to be fully functional. At the barangay level, the Barangay Health Midwife has been very active in organising the Barangay PHC Committee, in barangay consultation meetings where barangay problems are identified, prioritised and measures provided, and in the selection and training of Barangay Development Workers. The problem raised at this level is how to sustain active DWs participation in PHC.

### *Region II*

Region II embarked on a region-wide implementation of PHC even as the programme was still in its pilot stages. Despite the formation of a coordinating committee and the conduct of orientation seminars at all levels, lukewarm participation by agencies may still be noted. While the concept is well-accepted, commitment is lacking. Much of what has been done in the province is due to the zealous efforts of the Provincial Health Officer. From the region down to the barangay, informal coordination and person-to-person interaction is the practice. While there are passive implementers, there are active and highly motivated implementers as well. MOH staff in certain municipalities are quite active, succeeding in convincing member-representatives in the municipal PHC committees to work under the umbrella of the PHC. This enthusiasm was carried over and concretised in a successful fishpond project undertaken by the MOH personnel together with the barangay community. Such response is not surprising since the MOH staff in these places have been

very active in health-related projects even before the organisation of the PHC committee. Active implementers are the Rural Health Midwives who have shown initiative in securing barangay officials' cooperation.

The Barangay Health Workers showed active support to PHC despite problems of inadequate funding, facilities, incentives and the like. They have organised community assemblies as well as local PHC committees. A further exposure on the concept of PHC through training programmes is required for BHWs to increase their understanding of the PHC approach and not merely limit this to the Botica sa Barangay.

A major constraint which the PHC health implementers have to contend with is the general law and order problem in the area.

### *Region III*

Region III has gone a long way in implementing the PHC. The success being gained in the implementation of the programme in Nueva Ecija may be attributed to the Barangay Technician for Health Programme which started much earlier than the PHC. Moreover, the province of Nueva Ecija has been exposed to the concept of PHC much earlier because of the presence in some areas of the province of the Philippine Rural Reconstruction Movement Programme whose objectives are similar to that of the PHC. The involvement of PRRM has been tapped to a great extent because of its experience with the concept. Self-reliance is not an unknown practice in the localities and in some communities the residents are able to identify their problems, prioritise them, seek for solutions through projects and ultimately operate the projects themselves. The implementation therefore of PHC in these localities has been a lot easier. Community projects which are usually income-generating were already existing. There is high health consciousness among the people and the health staff. Thus the concept of PHC has been operationalised in existing and planned projects of the community. Therefore, the PHC approach to be used in this case is to provide the organisation structure which would harness and institutionalise inter-agency participation and ensure continued support and

cooperation. A PHC Committee which serves as a coordinating unit has been organised from the region down to the different barangays and has already undertaken social preparation activities, both in the pilot and non-pilot areas. The concept and strategy of PHC is integrated in the regional, provincial, and municipal development plans of the localities thereby enlisting the support of the political leadership of the region from the highest to the lowest levels.

#### *Region IV*

The organisation of an intersectoral coordinating unit for PHC and the conduct of the social preparation activities from the region down to the pilot municipalities and barangays as well as the implementation of PHC projects in the different barangays are major activities of Region IV. Though the intersectoral coordinating units are already organised at all levels, the linkages have to be strengthened and commitment has to be concretised. Participation of a religious organisation, the World Vision, through its conduct of orientation seminars for Barangay Health Workers and actual assigning of BHWs in the barangays was secured. The integration of PHC in the provincial and municipal development plans is still being worked out. Another major constraint is the lack of support of officials in a number of pilot municipalities and barangays. The opposition of the tribal natives in one barangay, misconception of the PHC to be largely a dole-out project and adherence to superstitious beliefs are other important deterrents to the successful implementation of the project in the region.

#### *Region V*

The Project Management Coordinating Council under the Bicol River Basin Development Project Office provides the coordinating mechanism for PHC, a totally different structure for coordination to the usual Regional PHC Committee convened in the other regions. A major policy adopted by the PHC is the reliance on voluntary cooperation of participating agencies in coordinating PHC activities. The MOH-RHO, however, remains the lead agency in PHC implementation. The idea of voluntary cooperation is well-taken by the agencies and shown in their participation in the formula-

tion of the PHC plans and strategies. Health staff has not taken up the responsibility for carrying out PHC at the municipal and barangay levels without reservations. There is little appreciation of and considerable negative attitude towards the programme. The activities undertaken under the PHC are not viewed as any different from the usual functions they perform and PHC is viewed as merely adding to the voluminous paper work that the RHU personnel have to accomplish. These negative attitudes have no doubt extended to the targeted beneficiaries as well. Despite these problems, social preparation activities are being continuously undertaken. Of significance is the MLGCD's, the barangay council's and private and civic organisations' participation in PHC. The MLGCD trainer, barangay council and the *Ilaw ng Buhay* organisation apparently are filling in the gap for the health staff in the implementation of the programme. The MLGCD trainer, for example, is responsible for discussing PHC objectives in a seminar, the *Ilaw ng Buhay* organisation for PHC information dissemination, the Kiwanis and the Jaycees support the PHC programme. However, inadequate training of the Barangay Volunteer Workers is another major problem.

### *Region VI*

Social preparation activities such as workshops, seminars and training on PHC have so far been Region VI's major activities. The nation-wide implementation launched in August 1981 necessitated expansion of social preparation activities. A Human Resource Development Programme for continuing education and training of health workers is planned. The guiding principle adopted by Region VI for PHC is the concept of partnership with a number of selected communities for health development. Thus, the emphasis on social preparation activities. In terms of political support, PHC concept was approved in principle by the RDC and informally integrated in the provincial development plan. As in other regions, logistical needs (transport facilities, supplies, funds) as well as the high turnover of PHC workers and law and order are major constraints for PHC implementation in the area.

*Region VII*

PHC implementation in Region VII was bolstered by the active participation of the Institute of Community Health of Silliman University in the training of Barangay Health Workers. The BHWs training enabled them to make referrals, treat simple diseases, assist in the Botica sa Barangay, visit and follow-up family planning acceptors. The coordinative mechanism from the region to the barangay has been set and the participation of private organisations, e.g., Kiwanis and Balikatan, as well as educational institutions, the Silliman University through the Silliman University Rural Integrated Development Programme, Silliman University Medical Centre/ Institute of Community Health, and Silliman University College of Nursing as signatories to the Memo of Agreement with the provincial PHC Committee secured. The success of PHC in the region is further attributed to the maintenance of a strong regional technical working group (TWG) responsible for the integration of PHC in the RDC and the task forces or its equivalent unit in the province, municipalities, and barangays responsible for securing practical leadership (Provincial and Municipal Development Councils, Barangay Councils) support to PHC. The participation in PHC of the Catholic Relief Services which provides similar services as that of PHC is yet to be harnessed. The social preparation activities in the area apparently have gone a long way, with the Botica sa Barangay, herbal gardening, Kadiwa, communal vegetable garden underway. Intensive orientation and training is another plus factor as difficulty in clarifying the PHC approach intra- and inter-sectorally comes up because of the presence of extremely programme and project-oriented staff. Frequent field visits and strong MOH leadership are facilitating factors in the PHC implementation in the region.

*Region VIII*

The vanguards for PHC in Region VIII are the Barangay Health Auxiliary Volunteers, TB paramedics, leader-health workers and barangay nutrition scholars. The success of the PHC in Region VIII is first and foremost credited to the Regional Health Office which spearheaded the training of local barangay volunteers known as Barangay Health Auxili-

liary Volunteers and Barangay Nutrition Scholars. Sharing this acknowledgment are the Visayas State College of Agriculture and the Leyte Sab-A-Basin Development Authority who subsequently initiated similar training programmes. Other organisations, private and religious, conducted training programmes for TB paramedics and leader-health workers. Whereas the aforementioned organisations are involved in short-term health manpower training, other educational institutions, e.g., DZRMH School of Nursing and the UP Institute of Health Science serve as institutional bases for health manpower training in the region; the former aims to produce traditional nursing graduates whereas the latter seeks to develop health manpower from the rural areas, who after training shall return to and serve their respective communities. Signs of effectiveness of the training programmes have been the BHA workers' activeness in the conduct of PHC activities, e.g., the constitution of barangay PHC, delivery of conventional health services, and the like. The implementation of PHC is hampered by the breakdown of law and order particularly in Eastern Samar, socio-economic unrest, local officials' lack of interest in the programme and the general disinterest of cooperating agencies toward the programme.

### *Region IX*

The nation-wide implementation of PHC caught up with Region IX which as a result undertook region-wide implementation. As in Region VIII, Region IX tapped the volunteer workers of the Sarikaya project of MOH National Family Planning Office for PHC implementation. The Sarikaya project calls for the training of volunteer workers coming from the barangays to promote self-reliance. These workers are trained as health educators to their respective barangays through the Information, Education and Communication component and as first aiders and referral persons to hospitals or doctors or other secondary health service delivery points. In addition to the Sarikaya Volunteers, training is also given by the health staff at the provincial and municipal levels to the Barangay Technicians for Health, Medical Auxiliary Workers and Barangay Supply Point Officers. They are oriented to the

PHC concept and approach and they serve as direct implementers of PHC related services in the community.

One major constraint to PHC in this region is the strong opposition of the church organisation to the Sarikaya Project and eventually to the Sarikaya workers by their promoting family planning concept and practice. A new PHC organisation has been adopted for Region IX. The Regional Health Office serves as the Regional PHC coordinator whereas the RPHCC chaired by the Lupong Tagapagpaganap ng Pook acts as the Programme Development Body. The activeness of coordinating units at the provincial, municipal and barangay levels varies depending on the support accorded by concerned development councils. Linkages have been successfully attained through the able leadership of the Provincial Health Officers.

### *Region X*

Region X implemented PHC with region-wide coverage. Adopting a strategy of utilising existing community based organisations, the RPHCC enlisted the Barangay Technicians for Health which existed even prior to PHC to undertake PHC activities at the barangay level. It is the BTH who takes charge of the Botica sa Barangay, serves as the Barangay Service Point Officer of POPCOM, assists the Rural Health Midwife in mothercraft classes and in Operation Timbang. The existence of BTH before PHC is attributed to the influence of PRRM on health staff who had undergone training in Nueva Ecija. They are the same health staff who initiated PHC in their areas of responsibility in the municipalities.

Inter-agency participation appears to be limited to social preparation activities and in some areas, it is very informal; thus, giving rise to unclear roles and functions of agencies in the PHC or confusion over too many agencies coordinating a single programme, which in effect is a monitoring problem. The absence of community resources and the usual problem of law and order are debilitating factors to PHC.

### *Region XI*

Two unique strategies adopted in the region-wide PHC implementation of Region XI are the Katiwala approach to

PHC delivery and the use of post board doctors and nurses as PHC catalysts. The Katiwala programme of the Davao Medical School Foundation which is a consortium of medical schools and hospitals involves the training of barangay health workers to become Katiwalas. These Katiwalas are charged with the delivery of primary health care in depressed and underserved barangays. As regards the post board doctors and nurses, they were given briefing and orientation on the PHC programme, after which a programme of action was drawn for a six-month stay in the area. The use of these strategies is meant to increase health staff in the region which faces the perennial problem of inadequate health manpower. The BHWs dropping out of the health delivery services due to work overload and lack of logistical support is not an uncommon occurrence. Moreover, there is low awareness of members of barangay councils and barangay health workers of the PHC concept. Orientation and/or training on PHC, particularly at the municipal and barangay levels, has to be intensified. Law and order is a problem that Region XI also has to grapple with.

### *Region XII*

Similarly, it is the law and order problem that threatens the continued implementation of PHC in Region XII as well as the health personnel in the area. It has slowed down the formation of PHC committees at the municipal and barangay levels. The success of PHC programme is further dependent on the type of settlement, location and presence of MHO. In the case of type of settlement, the observation was that Muslim communities are slower to adopt PHC activities than the Christian settlement. To facilitate PHC in Muslim areas, Imams are elected as chairmen of PHC committees. Caution and flexibility on PHC guidelines is exercised by health personnel in these areas. Lack of sufficient skills to handle PHC activities among BHWs is also noted. In terms of inter-agency participation, there is very minimal private sector participation whereas government agencies' participation is constrained by the representatives' inability to commit their agencies to PHC because of absence of directives from their

national offices. Another problem identified is: "the continuing omission of PHC programme presentation to the municipal and provincial development councils coupled with the absence of any plan to present the same to the RDC". This may be the principal reason for weak participation of line agencies and the lesser support that is currently being felt by the pilot areas from the local governments.

#### MECHANISMS FOR COORDINATION AND COMPLEMENTATION

Among the strategies adopted for the implementation of PHC is the strengthening of inter-agency linkages and the reorientation of services towards a holistic and comprehensive system of health delivery. The principal method by which this was to be achieved is through the organisation of planning committees and work groups in the national, regional, provincial, municipal and barangay levels. It was expected that this hierarchy of related units would provide the organisational backbone of the programmes and would serve as the principal venues for close and binding inter-agency relationships.

Substantial efforts have been initiated to establish the mechanisms of coordination and complementation. These include:

1. organisation of PHC committees at all levels and the members include the representatives from other government and private agencies;
2. organisation of PHC Technical Working Groups/Task Forces; and
3. attempting to integrate PHC in the various development plans.

#### *Primary Health Care Committees*

At the national level, the MOH works hand in hand with the Social Development Committee (SDC) of the National Economic and Development Authority (NEDA). The SDC serves as the central coordinating body whose major functions are setting national PHC strategies and collaborating with

agencies outside the social sector for a solid commitment to PHC.

A primary health care committee was created composed of senior officials of health and health-related ministries, educational institutions and representatives of the private sector (professional, social and religious organisations). The body is chaired by the Minister of Health and charged with policy-making and coordinative function of primary health care activities. The committee's role is to ensure proper translation of the national PHC policy to the local levels and to facilitate implementation of PHC at the local levels.

Ministries and agencies are represented in the National Primary Health Care Committee. They include:

1. Ministry of Agriculture,
2. National Economic and Development Authority,
3. Ministry of Education,
4. Ministry of the Budget,
5. Ministry of Human Settlements,
6. Ministry of Local Government and Community Development,
7. Council of Health Agencies,
8. Philippine Medical Association,
9. National Nutrition Council, and
10. Commission on Population.

The national PHC committee is supposed to submit periodic reports on the status of PHC implementation to the SDC.

Although the Ministers are generally the signatories to the memo of agreement, the Deputy Ministers or delegated representatives attend the national primary health care committee meetings. As of the time of evaluation, three meetings have been conducted by the national PHC committee.

At the regional level, Regional Primary Health Care Committees (RPHCCs) are utilised to take care of the implementation of PHC. In most cases, these RPHCCs are not newly-formed organisations but existing intersectoral groups, the Health and Nutrition Sub-committees of the Regional Development Council (RDC). In many cases, however, the membership has been expanded to include other agencies

which are not directly involved with the Health and Nutrition sub-committees although they are also members of the Regional Development Council. In Region V the Project Management Coordination Council of the Bicol River Basin Development Project (BRBDP) was the coordinating body.

The organisation of the regional PHC committees reflects a slight departure from the guidelines circulated by the MOH central office. First, there are more agencies represented in the committee than is suggested by the guidelines. Second, and more important, the committee is composed of technical personnel rather than regional directors.

In functional terms, the meetings at the regional level serve as forums for assessing the headway gained in PHC and for identifying the support needs of the different participating agencies. The agencies give a report of the extent of progress of their PHC related projects and at the same time air their needs to which other agencies may respond.

However, the mechanisms of coordination and complementation have not yet been developed in some regions. The institutional arrangements that will guarantee an efficient coordination among the involved agencies appear not to have been fully established despite present efforts to develop one in Regions I and XII.

Provincial Primary Health Care Committees have been established in all pilot provinces except one. The organisation of the provincial PHC committees did not, however, come about until the nationwide implementation of the programme in 1981 in the provinces of Camarines Norte, Zamboanga del Norte and Agusan del Norte.

Variations in the structure and organisation of the provincial PHC account in part for the differences in intersectoral linkages that have been achieved in each of the provinces.

The Provincial PHC Committee in Pangasinan is headed by the Provincial Governor. The organisational set-up not only allowed for direct interaction between the Governor and the PHO, but also made possible the interaction between other private and public agencies through the PDC which is chaired by the Governor.

In Kalinga-Apayao, the provincial PHC was organised around the health and nutrition sub-committee of the PDC.

Originally composed of 10 government agencies, the reconstruction into the current PHC committee paved the way for the inclusion of three other agency representatives.

In the Province of Nueva Ecija, the PHC is more popularly known as the Provincial Inter-Agency Committee (PIAC). It draws its membership not only from the government and private agencies directly involved with health-related activities but other sectors as well like the religious groups and the farmers' associations. Another variation lies in the chairmanship of the committee. The PHC committee is chaired by the MSSD representative.

Membership in the PHC committee of Negros Oriental includes representatives from the Sangguniang Panlalawigan and three representatives from Silliman University. Chairmanship of the committee, being vested in the Provincial Administrator, makes possible a new strategy for implementing PHC projects. Projects to be planned, implemented and evaluated are coordinated at the Provincial Administrator's Office by a proposed Provincial Management Committee. This committee was designed to "operate as a development catalyst for local governments...to attain the desired goal and objectives of the provincial government." This proposal, if approved, is envisioned to strengthen PHC implementation at the municipal and barangay levels.

The Provincial Development Council acting as the coordinating body for PHC in Eastern Samar has not taken the lead to coordinate activities of sectoral agencies. Coordination with sectoral agencies is being undertaken by the then PHO now incumbent Regional Director of the RHO.

The Provincial PHC Committee in Zamboanga del Norte is not the Health and Nutrition Sub-Committee of the Provincial Development Council though most of the members of the sub-committee are members of the PHC committee. The Provincial PHC Committee was organised solely for PHC. It is chaired by the Governor, with the Vice-Governor as Chief Executive for committee policies. The members include chiefs of provincial offices and heads of private service clubs like the Kiwanis, Lions, Rotary and Jaycees.

The Provincial Primary Health Care Committee in Agusan del Norte was established only in September 1981. It is

chaired by the Provincial Governor with the PHO designated as PHC Coordinator. Since it is only a newly formed body, it is still in its organisational phase.

No PHC committee was organised in the Province of Maguindanao. Faced with circumstances of government restructuring, the PHO was unable to elevate the programme to the PDC. The non availability of proper authorities to attend the inter-agency workshop and to commit their agency to joint PHC ventures in addition to the national mandate to immediately implement the programme forced the PHO to implement the programme in the absence of a functional coordinating body.

At the municipal level, the Municipal Development Councils or their health and nutrition committees with expanded memberships were tapped as coordinating mechanisms. In other areas, the municipal PHC committees actively involved the political, educational, and technical leaders (PET) as well as the agencies involved in the delivery of primary health care services; among these are Mati, Davao Oriental; Simbulan, Negros Oriental; and Katipunan, Zamboanga del Norte. Different strategies were used in other places. For instance, in Carmen, Agusan del Norte, there was no municipal committee established at the time of the study, and the public health nurse (PHN) acted as coordinator. In municipalities in Muslim Maguindanao, the Imam or religious leader played a role in the sense that his opinions counted a lot in making the residents accept PHC.

In the inter-sectoral committees created in the municipalities, the *Sangguniang Bayan* led by the Mayor performed a formal role, even if in some areas the involvement of the SB members was lukewarm.

At the barangay level, the Barangay Council led by the Chairman (or Captain) served in many cases as coordinators. In many cases private organisations were represented in the PHC committees, and also the *Purok* leaders. Innovations were nevertheless formed in some barangays, especially when the Barangay Councils did not support PHC. In those areas, the public health midwife (PHM) did the job of coordinating the barangay health workers (BHW) sometimes called barangay health technicians (BHT) or barangay volunteer workers

(BVW). In one barangay, the Barangay Nutrition Scholar did most of the work. Barangay Plaridel in Aborlan, Palawan, had a very sophisticated approach in that it created the Plaridel Developer Association.

Formal memoranda of agreement were entered into by the different agencies involved in PHC. These were usually signed after inter-sectoral workshops had been held as social preparation activities at various governmental levels.

*Primary Health Care Technical Working Groups/Task Forces*

The Implementing Guidelines for Primary Health Care provided for the organisation of technical working groups (TWG) to assist the PHC Committee in the implementation of the programme. The TWG is to be chaired by the PHC Coordinator and its members are to come from the ministries/agencies composing the PHC. The stipulated functions of the TWG are the following:

1. to provide technical support to the PHC Committee;
2. to develop mechanisms of coordination and complementation for PHC activities;
3. to develop appropriate monitoring and evaluation systems for PHC activities at all levels;
4. to serve as a clearing house for PHC project proposals;
5. to develop guidelines for the utilisation of the barangay seed fund; and
6. to perform other functions which may be assigned by the PHC Committee.

At the national level, the TWG organised comes from the following ministries/agencies:

1. Ministry of Health,
2. National Economic and Development Authority,
3. Ministry of Education,
4. Ministry of Local Government and Community Development,
5. Ministry of Human Settlements,
6. Ministry of Agriculture,

7. Ministry of Social Services and Development,
8. University of the Philippines System  
(Institute of Public Health and Comprehensive Community Health Programme),
9. Nutrition Council of the Philippines,
10. Project Compassion,
11. Council of Health Agencies, and
12. Council of Welfare Agencies.

At the regional level, the technical working groups that have been organised are more often not inter-sectoral. In Region IV, the technical staff is composed of the Regional Nurse Supervisor, Regional Training Officer, Regional Planning Officer and the medical specialists. In Region VII, eight members of the regional health staff compose the regional technical staff to assist the PHC Committee. In Region VIII the composition includes three senior nurse supervisors and 11 senior health educators; and in Region XI, it is composed of four members of the regional health staff. In Region XII, regional health officers and the PHO of the pilot province of Maguindanao and other members of the provincial health staff compose the TWG.

In Region II, the programme implementers did not see a need to establish the TWG since the PHC Committee was composed mainly of technical people. On the other hand, the absence of a PHC Committee in Region I and Region XII necessitated that the coordination of the programme be undertaken by the TWG.

At the provincial level, the technical working groups organised can hardly be said to be inter-sectoral.

In Pargasan, a Provincial Health Care Unit (PHCU) was organised headed by the Provincial Action Officer and composed of technical staff from the PHO to act as the TWG provided for in the implementing guidelines.

In Kalinga-Apayao, Eastern Samar, Maguindanao and Zamboanga del Norte, most of the tasks that would have been assigned to the TWG are being performed by their respective PHOs. In Nueva Ecija, and in Davao Oriental, the PHC Committee seems to be performing these. It is not

clear, whether in fact, a TWG exists in each of these provinces.

In Negros Occidental, the TWG is composed of the officers of the Primary Health Care Committee. In effect, the PHC Committee performs the tasks of the TWG.

The TWG organised in Negros Oriental is called the Provincial Training Task Force. This was organised to assist the PHC Committee and is composed of staff members from the PHO. The fact that it is called 'provincial training task force' implies that its functions revolve around training.

### *Integration of PHC in the Various Development Plans*

One of the strategies adopted to ensure coordination and complementation of the various agencies' efforts at development was the working for the inclusion of the approach in the various regional, provincial, municipal and barrio development plans. While substantial efforts for the inclusion have been made during the various inter-sectoral workshops and PHC committee meetings, the fact that these activities have come at a time when the various development plans have been prepared account for the inability for the inclusion of this in many of the development plans. However, not only have commitments to include this been made but drafts have been prepared integrating the PHC concept. The PHC approach has been successfully integrated in the Regional Development Plans of Region X and the Provincial Development Plans of the Provinces of Palawan, Pangasinan and Davao.

In Region I, the draft plan which attempts to integrate the PHC concept is supposed to be included as part of the Five-Year (1982-87) Regional Development Plan. The draft plan adopts PHC as the approach to be utilised in the attainment of the following critical areas of concern:

1. Control of communicable and non-communicable diseases;
2. Improvement of environmental sanitation;
3. Improvement of health care services;
4. Promotion of dental care;
5. Promotion of mental care;

6. Improvement of maternal and child care;
7. Improvement of medical care;
8. Development of manpower resources for health;
9. Improvement of infrastructures;
10. Promotion of health education;
11. Implementation of the family planning programme;  
and
12. Implementation of the nutrition programme.

In the pilot province, Pangasinan, the concept of PHC has been adopted as the approach to be utilised in the implementation of the programmes under the health component of the Pangasinan Integrated Area Development (PIAD) Project. It has been well stated that:

All the nutrition and health programmes would gradually adopt the newly endorsed concept of Primary Health Care. The concept of PHC is an approach to health development which is based on the strong community involvement and partnership with the government programmes and inter-sectoral relationships. This envisages that the community defines its own health problems and needs and participates in carrying out programmes or activities in collaboration with the government agencies and private sectors.

While no mention has been made yet of the PHC approach in the 5-Year (1978-82) Development Plan of Region III since this was prepared in 1977, the concern of the PHC as a strategy has been included in the Statement of Regional Concern and Development Strategy for the period 1983-87 which was submitted by the Regional Executive Director to the NEDA main office. The same statement of concern and strategy will be used in formulating the Regional Development Framework Plan for the same period. Under the heading "Major Development Programme", the concept of PHC is introduced as follows:

LOI No. 949 mandated the adoption of the PHC approach

care delivery at the community level by employing more medical personnel and an effective reference system to supplement the services available at the community level.

PHC is thus recognised by the RDC of Region III.

The first step to the inclusion of the PHC approach in the Regional Development Plan of Region VI has been taken. Resolution No. 1 Series of 1981 of the RDC officially recognised and adopted the efforts and outputs done by the MOH in the region. In the resolution, the implementation of PHC is proposed to be under the umbrella of the RDC. The PHC programme was approved in principle as an official programme of RDC VI recognising the Regional Health Office as the lead agency in its implementation.

#### SOCIAL PREPARATION ACTIVITIES

The initial phase of the PHC implementation was characterised by intensive social preparation activities undertaken at the various levels. These include facilitative activities, intensive training of implementing units and field implementation activities.

##### *Intra-sectoral Workshops*

Intra-sectoral workshops were conducted at the regional, provincial and municipal levels designed to orient the key personnel from various sectors of public health on the concepts and approaches of PHC.

At the regional level the workshop aimed at reorienting health personnel on the concept of health care delivery away from the recipient-provider type to that of the PHC approach focusing on development of self-reliance among the people in managing health development issues. These were generally held at the Regional Training Centres of the MOH. More often these would include division and section chiefs of the Regional Health Office. Although one province for each region has been selected for the piloting of PHC, in most cases, provincial and city health personnel and chiefs of provincial and city hospitals from the other provinces and cities in the region were made to attend the workshop.

### *Inter-sectoral Workshops*

Inter-sectoral workshops aimed at establishing linkages not only among public health offices but also among various government and private agencies involved in the socio-economic development of the region were conducted at the regional level. The participants to the workshop were generally senior officials of different agencies in the region including the MOB, MA, MLGCD, NEDA, POPCOM and MPI.

In some regions leaders of civic and religious organisations attended the workshop, like the Vicar General, the World Vision (a Protestant organisation), Foster Parents Plan, and the Bishop of Ilagan, Isabela in Region II; the Iloilo Medical Society in Region VI; the UP Comprehensive Health Programme in Region IV; the Philippines Medical Association, the Philippine Hospital Association, the Red Cross, Rotary, Kiwanis, Jaycees and Lions Club in Region IX; the Misamis Oriental Medical Society and the Misamis Oriental Dental Society in Region X.

The seminar generally aimed at eliciting participation and support from different agencies as well as organising a co-ordinative structure for PHC implementation in the region.

The workshop schedule included group work, field visits and group discussion on: (1) the PHC concept and its strategies for the delivery of the programme to the community, (2) its planning, implementation and evaluation, (3) the roles and responsibilities of cooperating agencies, (4) the need for inter-sectoral collaboration for effective utilisation of resources, and (5) the various community health and development projects.

In some cases the output of the seminar would be provincial and city plans for the PHC programme implementation. Capping activity usually is the formation of the PHC committee and the signing of a Memo of Agreement expressing the agencies' commitment to the PHC programme.

### *Training of Trainers Workshops*

Training of Trainers Workshops were also conducted for members of the training staff of the provincial health offices in each of the regions. Likewise, the provincial training staff conducted similar trainings for municipal health officials. The

participants were to spearhead the eventual training/orientation of all implementing units. This group would later take charge of orienting all other MOH units towards PHC objectives.

The course was designed to strengthen the training skills of the participants in areas of community development, planning and evaluation. The training was usually divided into two parts: the first part (usually taking 2 weeks) was devoted to orientation and preparation of a training design for pilot and non-pilot municipalities; the second part (usually taking about 3 days) was spent in the communities during which time the trainees fielded survey questionnaires in their respective areas to determine the training needs of midwives, nurses and sanitary inspectors.

### *Training of Barangay Health Workers*

Even as social preparation activities have hardly been begun at the regional level, the PHOs and MHOs of the pilot provinces and municipalities who were oriented in Manila have begun training selected Barangay Health Workers in their respective jurisdictions. These workers were to spearhead the organisation of the communities and the promotion of self-reliance. They were trained as health educators, first aiders and as referral persons to hospitals or doctors or other secondary health service delivery points. Hundreds of selected barangay development workers have been trained since the implementation of the programme.

### LINKAGES WITH OTHER AGENCIES

Primary Health Care Committees and Technical Working Groups composed of representatives of the different government agencies and private groups have been organised at all levels of government—national, regional, provincial, municipal and barangay to achieve inter-agency coordination and cooperation. Memoranda of Agreement have been signed by no less than the heads of these various agencies expressing commitment to the PHC approach. Inter-sectoral workshops have been conducted expressly to ensure the participation in the programme of the agencies concerned.

At the regional level, the exposure of other agencies is

limited to being resource persons/speakers in assemblies. From outward impressions, there does not appear to be inter-agency cooperation; whatever activities are being undertaken are being solely carried out by the MOH. Although agencies are described as cooperative, there is too little by way of organised and collaborative work to justify this description in the inter-agency content of the PHC.

This may be attributed to a number of factors:

1. the regional level may be too high to justify involving personnel of other agencies in the details of implementing the programme;
2. in general, the activities undertaken at the regional level, can be characterised as being intensely applied to training of personnel in implementing units, to which facilitative activities are only secondary. To a very large extent, this is responsible for inadvertently confining the major tasks within MOH responsibilities and contributes to the misconception that PHC is still principally an MOH concern; and
3. neither the roles to be played by these agencies nor their commitments are operationally defined. The Memoranda of Agreement signed express these roles and commitments in very general terms. Thus, the agencies express commitment to the concept and agree to cooperate in the endeavour but have not yet operationalised these commitments.

In functional terms, however, the PHC committee meetings at the regional level serve as forums for assessing the headway gained in PHC and for identifying the support needs of the different participating agencies. The agencies give a report on the extent of progress of their activities that are by nature related to PHC and at the same time air their needs to which other agencies may respond.

At the provincial level, there are more indications of linkages with private and other government sectors being better achieved.

There is active participation on the part of the provincial government in a few of the pilot provinces. In Pangasinan,

the Provincial Governor is the chairman of the Provincial Primary Health Care Committee. Likewise, in Negros Oriental, the Provincial Administrator acts as the chairman of the PHC committee whose office is responsible for providing assistance to the local executives in the planning, implementation and coordination of development programmes and projects. The provincial government provided financial assistance for some PHC activities undertaken in other provinces.

The Ministry of Public Information and the Ministry of Education in Camarines Norte were involved in the informational and educational campaign for the programme.

The PRRM in Nueva Ecija was heavily involved in the social preparation activities of the province and was responsible for the training of barangay health workers and was involved in the conduct of inter-sectoral workshops in the municipalities.

In Negros Occidental, although no specific collaborative work can be cited as evidence of established linkages, the various government sectors did have a hand in the conduct of the seminars and workshops. Representatives of these agencies, particularly those in the social development sector acted as facilitators in group dynamics, resource persons/lecturers, and participant educators. Notable are the MSSD, MLGCD, POPCOM, and the Provincial Development Staff of the Office of the Governor. The Negros Occidental Medical Society and the Negros Occidental Dental Society also sent facilitators. The Christian Reform Church also participated in these seminars. There is strong evidence that inter-agency collaboration would be actualised. Maintenance of these linkages is expected from joint undertakings in the future.

The Province of Negros Occidental utilised the Silliman University for the training of Barangay Health Workers. For this reason, the regional training staff was relieved of the responsibility of undertaking this particular training activity.

In no other province is the concept of linkage more clearly operationalised than in the province of Zamboanga del Norte. And yet, no inter-sectoral workshop was conducted at the provincial level and no PHC Committee was organised until

the directive for the nationwide implementation of PHC was given in August 1981. Even prior to the initiation of the PHC programme, close coordination and complementation in effecting programmes has been maintained by the PHO with relevant ministries and agencies and the mass media. This was, however, intensified with the piloting of the PHC programme in the province.

#### MANNER IN WHICH PHC POLICY IS TRANSLATED INTO PROJECTS/POLICIES BY THE VARIOUS PARTICIPATING AGENCIES

While the long-term objective of the PHC approach as adopted in the Philippines is "to gain health for all Filipinos by the year 2000", the strategy adopted called for the shorter-term objective of partnership with selected communities adopting the inter-sectoral approach. In operational terms this meant the undertaking of projects by the communities in partnership with different agencies of the government and private institutions.

Much attempt has been made to speed up the process of getting communities to begin undertaking projects. Most often these were part of existing programmes of the various agencies operating in the locality. While there is no doubt that these projects would lead to the development of the communities, they were, however, undertaken as parts of agency programmes rather than a conscious identification by the members of the community of a need to respond to. A number of projects that antedate PHC have been brought under the general orientation of PHC by the participating agencies and have been entered into the different programmes of the MOH. The valuable contribution of the PHC programme, however, would be the intensified efforts of the various agencies to implement these projects in the communities and the seeking of community involvement in the implementation of these and, to add to this, the involvement of MOH in the delivery of these services.

Among these projects are the following:

1. The Herbal Gardening Project;

2. The Mothers' Classes and Feeding Programme of the MSSD;
3. The Botica sa Barangay Project of the MOH;
4. The Family Planning Projects of the POPCOM and MOH;
5. Livelihood Projects of the BAI and BFAR;
6. The Environmental Sanitation Projects of the MOH; and
7. The Barangay Health Worker's Programme.

### *Herbal Gardening Projects*

Herbal gardens, originally initiated through the public school system, was adopted as a PHC project in almost all of the pilot areas. Barangays were encouraged to plant medicinal herbs in their backyards and plots.

In certain barangays, as much as 80 per cent of households have planted herbs in their gardens. Not only did households take to planting herbs and medicinal plants in their backyards; in one of the barangays in Zamboanga del Norte, a 600 sq. m. lot near the public market was designated by the Barangay PHC Committee as a site for herbal gardens.

In a number of communities the herbs have been used by the people to treat boils, fever, colds, diarrhoea and scabbies. In one barangay in Carmen, Agusan del Norte, the BHT of Barangay San Agustin produced cough syrup from indigenous plants which was sold to the residents at nominal amounts.

In most cases, however, while all-out campaigns have been going on for the planting of herbs, utilisation of these has been minimal. In some barangays, resistance to the use of this has been expressed by the members of the community who prefer to use actual medicines.

### *Mothers' Classes and Day Care and Feeding Centres*

To the credit of MSSD, mothers' classes and feeding programmes have been going on in many barangays even before the adoption of the PHC approach. A mothers' class covers such subjects as parenthood, prenatal examination, nutrition for the family particularly pregnant mothers, growth of

foetus and confinement, care of the newborn, family planning, dental services, control of communicable diseases, environmental sanitation, cooking, basket weaving, sewing, etc. Day-care and feeding centres consisted of feeding pre-school children with more nutritious food to prevent malnutrition.

While these programmes would, no doubt, still be going on in spite of PHC, stronger collaborative efforts between the MOH and the MSSD on the one hand and the government and the people on the other has emerged as a result of PHC. Barangay midwives and barangay health workers now assist in the effort and have encouraged the maintenance of these through participation and contribution of the members of the communities

#### *Botica sa Barangay Projects*

Botica sa Barangay was given impetus with the introduction of PHC. The project was intensified in areas where there were existing boticas and introduced in places where there were none. Various strategies were used for the establishment of the botica. For instance, in Borongan, Eastern Samar, a pharmaceutical kit of P1,000 was provided by the Ministry of Local Government (MLG) using barangay development funds. In Barangay Binerangan, Sindangan, Zamboanga del Norte, the botica was funded by the Sindangan Emergency Hospital and was managed by the Municipal Development Worker who was also the Barangay Supply Point Officer (BSPO) of the Population Commission (POPCOM). In Carmen, Davao Oriental, the sale of medicine received from the Regional Health Office was rolled into the purchase of other medicines. To raise funds for a botica, the midwife and the BHWs of Barangay Balugo, Sibulan, Negros Oriental solicited P2.00 per household and sold the medicines at a 5 per cent profit. A higher amount of P30.00 per household was exacted by Barangay Sta. Cruz Viejo, Tanjay, Negros Oriental; however, the amount was collected in instalments and returned to the contributors after one year without interest. In some areas, the people had to contend with barangay capitalists who sold medicines at exorbitant prices.

Eliciting self-reliance in the project has not been easy as

people have been used to receiving the medicines for free. But success has been gained in many barangays. The problem, however, remains as to the continued maintenance of these boticas and how to make them more responsive to the health needs of the populace. It was expressed in many instances that the much needed medicines were not available in these boticas.

### *Family Planning Projects*

Family planning projects of the POPCOM and the MOH were continued and intensified in the pilot PHC areas, although in some municipalities, the active opposition of the parish priests (who in some cases refused to give communion to contraceptive users) was a deterrent. It has even discouraged several barangay health workers from continuing their voluntary services.

### *Livelihood Projects*

Livelihood Projects were also embarked upon. Piggeries and fishponds supported technically by the Bureau of Animal Industry (BAI) and the Bureau of Fisheries and Aquatic Resources (BFAR) were intensified. Other income generating projects embarked upon were handicraft, mushroom culture and other cottage industries.

### *Environmental Sanitation Projects*

The construction of water sealed toilets was a project undertaken in many barangays. One of the notable achievements of the PHC programme would be the increase in the number of structures having water-sealed/bucket flush toilets.

### *The Barangay Health Worker's Programme*

Perhaps the one aspect where the PHC policy has been most successfully translated into action is the Barangay Health Worker's Programme. Barangay Health Workers were selected by the community from amongst their members and were trained so as to develop them as functional partners in meeting the critical health needs of the community. The PHC programme has been able to develop a breed of highly moti-

vated individuals willing to pursue the PHC cases in the communities.

The Barangay development workers have been very effective in rendering basic health services like immunisation, health education, family planning motivation and treatment of simple symptoms like colds and fever. They have also referred patients to higher levels when the cases were beyond their capabilities.

In many municipalities the BHWs were also instrumental in the organisation of community projects. By their active solicitation, barangay health stations were constructed, most of the time by using resources (manpower and material) from the community. Several Boticas sa Barangay were started through the initiation of these workers. Environmental sanitation campaigns and construction of toilets have been successfully carried out through their efforts. These workers have been instrumental in the introduction of the PHC approach in many communities and in attempting to instill the concept of self-reliance among the members of the community.

One achievement of a BHW worker in Guimba, Nueva Ecija is worth noting. The BHW conceived of a project, *Kabalikat* (the BHT understudy project), because of the desire to have someone assist her in the administration of the projects and also to share the gained knowledge from her training. She chose one representative from each *Purok* through the help of the councilmen and conducted a one-month seminar at the local elementary school where she taught them everything she learned from her own training. She was supported by the RHU personnel who acted as lecturers for some of the topics. These understudies are now utilised particularly in the distribution of medicines and in the initiation of projects in the barangay.

The consideration that all these are being done on a voluntary basis makes these achievements even more laudable.

#### EXTENT OF RELIANCE ON COMMUNITY RESOURCES FOR IDENTIFYING AND RESOLVING HEALTH DEVELOPMENT ISSUES

The extent of the reliance on community resources for identifying and resolving health development issues cannot as yet

be measured because community capability for undertaking these still remains to be developed. The national strategy and plan of action for achieving health for all Filipinos by the year 2000 concedes that the implementation of the partnership strategy in health development ought to be a slow and deliberate process. Several prerequisites have first to be met before people in the rural areas can be expected to be fully self-reliant in identifying and resolving health issues. These include: (1) the need to establish or strengthen community organisations; (2) the need to develop or strengthen leadership, planning, organisation and communication skills for health development; (3) the need to relate and coordinate effectively with government and other agencies in planning, implementing and monitoring health development activities; (4) the need to develop among the people the willingness to share limited resources; and (5) the need to develop among the people awareness and consciousness of the importance of good health and how best to achieve these.

Extensive social preparation activities at the community level have to be undertaken before these can be achieved. For most of the communities under study, the concept of self-reliance is new. The extent of social preparation activities undertaken in the communities has not been sufficiently applied to expect the results intended.

However, the prospects of achieving success are bright. In communities with wider exposure to the partnership and self-reliance concepts in community development some success has been gained in achieving reliance on community resources for identifying and resolving not only health issues but other development issues as well. In Nueva Ecija where community-based health projects antedate the formal adoption of PHC, studies of the community projects show, that to a large extent, there was reliance on the community for identification and resolving of development issues.

#### EXTENT OF PARTICIPATION OF COMMUNITIES IN IMPLEMENTATION OF PROJECTS

Although only slight success has so far been gained in developing reliance on community resources for identifying and resolving health issues, much can be said about community

participation in the implementation of the projects. In many communities, participation and contribution of the residents have clearly been sought. People's participation has been not only in the form of providing labour where needed but also in the form of monetary and non-monetary contributions. The following provides illustrations of the success gained in enhancing the partnership concept of PHC:

1. In one barangay in Zamboanga del Norte, a dam was constructed through the bayanihan effort. Labour was provided by the residents of the area.
2. In another barangay, also in Zamboanga del Norte, the residents sponsored benefit dances and voluntary contributions to raise funds for those who plowed the field for a vegetable garden project.
3. In Barrio Makapinlag in Nueva Ecija, a pig-raising project funded by a civic organisation was initiated by the community based on the identified need of having to generate more income to augment means of livelihood. The community members organised themselves into a group, prepared a resolution and approached the President of the *Samahang Nayon*. Swines were distributed to 23 households chosen on the basis of income and attendance in a seminar on pig raising. The community established an association to handle the project. The association charged P10 for every pig sold in order to raise funds which were to be used for forthcoming projects.
4. In Barangay Ayos Lomboy in Nueva Ecija, residents agreed to construct their own toilets and shouldered some of the costs. Gravel and sand were contributed by the town Mayor but residents constructed their own toilet bowls using the potter provided by the RHU.
5. In Barangay Gabaldon, a brick making project was launched to make bricks available for the construction of a cooperative hall for the community and construction of toilets. Families were involved in this labor-intensive project. The families agreed to contribute 10 bricks each for the construction of the health center's

extension. It is already built and functions as the barangay's cooperative center. All the households in the barangay made bricks which were used to construct toilets. Some of the bricks were sold for P0.50 each.

6. In one barangay in Zamboanga del Norte, members of the community were involved in seeking solutions to problems connected with the water-sealed toilet project. The problems included the high cost of materials needed to construct the toilets, the lack of technical know-how for making the bowl and the non-availability of water. The toilets were constructed by the members of the community or some entrepreneurs under the supervision of the sanitary inspector. People were taught to use 'already-used' water for flushing the toilets.
7. Fishpond projects in several barangays in Kalinga-Apayao involved the construction of fishponds out of fallow ricefields by residents contributing free labour. The fishponds were stocked with carp and mudfish contributed by fishpond owners in the province. The success with these demonstration projects became the basis for using the fishponds for the next series of food production projects: fish dispersal projects are now being contemplated in other barangays.
8. A 'gulayan' or a communal vegetable garden was cultivated in a vacant lot in the heart of Barangay Tagbina in Mati, Davao Oriental, to provide income to support community projects. The households are given assignments in tilling and taking care of the plants—eggplants and onions.
9. A number of barangay health stations have been built through funds solicited from members of the communities, through donations of vacant lots by certain land owners and through fund raising campaigns launched by residents and through the manpower resources contributed by the residents.

The list is by no means exhaustive but is illustrative of the success gained in developing partnership with the communi-

ties in the implementation of development projects. It serves to illustrate that given more time and effort the rural people would become highly motivated to seek solutions to their problems with minimal government intervention.

#### ISSUES AND PROBLEMS IN THE IMPLEMENTATION OF PHC

Primary health care as a new and untried concept naturally faced problems of implementation in the early stages covered by the study. These problems may be grouped into the following categories: (1) coordination and complementation of agencies and institutions involved in the implementation of PHC, (2) logistics, (3) community participation and NGO involvement, (4) project management, and (5) miscellaneous factors.

##### *Coordination and Complementation of Agencies and Institutions Involved in the Implementation of PHC*

The earlier discussion showed two basic approaches used in the attempt to coordinate sectoral activities: (a) utilisation of existing development councils (RDC, PDC, MDC), and (b) creation of special coordinating bodies (task forces, units, associations). In some cases already mentioned, there was no coordinating mechanism at all established and even where inter-sectoral bodies were established the workers of the Ministry of Health did most of the job, and in a few barangays the work was done only by the public health midwife and/or the Barangay Health Worker.

The first approach, though based on the rationale that the development councils are inter-sectoral, already suffered from basic defects. As earlier studies have shown, many local development councils have been ineffective, members having lukewarm interest, the Councils bereft of implementing powers. In Region V, the presence of the Bicol River Basin Development Project made the mechanism for coordination easily identifiable, but problems still occurred in that the agencies "were pre-occupied with their own responsibilities and problems" and were "paddling their own canoe" but performing similar projects. One great disadvantage of assigning the job to the councils could be the presence of other

concerns of the members when they met together. Also, the inability of the council task forces to prod the agencies concerned even before the birth of PHC should have been enough ground for being sceptical about their ability to perform the new task. Finally, studies have also shown that the dynamism of development councils depends heavily on the capability and commitment of the leadership. These case studies showed that in certain areas the committees never met after the organisational stage or met only once or twice if at all.

The creation of a special body (or the revitalisation of an existing one) could be an advantage in that the members would be concerned with only one responsibility—PHC. But again, the success of such an undertaking hinges on the leadership. In Pangasinan, the establishment of the Provincial Primary Health Care Committee had the advantage of having a strong and committed Governor as chairman; consequently, PHC was easily incorporated into the Pangasinan Integrated Area Development (PIAD) Plan. In many special bodies created, even if the chairmen were Governors or Mayors, enthusiasm died down after the organisational meeting.

In some areas cited earlier, PHC workers could not even get the level chief executives to form a PHC coordinating committee. The PHM of several barangays have had to perform the function, aided by BHT (or BHWs). Non-MOH activities remained under their different sectoral agencies and therefore, no orchestration of efforts occurred.

In any case, whether the council approach or the special committee approach was used, MOH workers had to take not only the lead role but most of the responsibility. What happened was that the MOH personnel had their hands full of health activities and could not really coordinate other non-MOH responsibilities related to PHC.

It appears that memoranda of agreement notwithstanding, the complementation of PHC efforts leaves much to be desired.

### *Logistics*

A perennial problem in any government programme—the

lack of funds and competent personnel—also plagues the PHC.

The establishment of coordinative mechanisms had not been complemented by a mechanism for raising funds solely for PHC activities. This was made more complicated by the sectoral nature of PHC efforts. The assistance given by non-governmental organisations had been on project basis, e.g., feeding of malnourished, Botica sa Barangay, and therefore not encompassing. Efforts by residents were also sporadic. Furthermore, poverty in the rural areas had greatly limited the sources of funds for PHC activities.

The paramedics sent out to deliver PHC services were relatively inexperienced because much of the choice of BHT was based on availability. A high drop-out rate was seen among the trained BHT's, even among the Katiwalas in Davao. And yet, PHC agencies were unable to provide the incentives that the BHT's required.

The problem was more acute in some areas like Sultan Kudarat and Parang who had only one MHO between them and sometimes none at all.

Much of the area chosen for piloting were mountainous and hazardous territory. The lack (or even absence) of transportation facilities mitigated against effective service delivery.

#### *Community Participation and NGO Involvement*

In all the regions studied, a general problem perceived was the 'lukewarm,' 'negative' or 'indifferent' attitudes of the targeted beneficiaries.

In Region V, people were apprehensive about family health care because they were accustomed to regard medicine in terms of modern practices; thus, they preferred doctors to the more accessible if less educated midwives.

The problem in Region XII was compounded by the religious aspect. Muslim communities were slower to adopt PHC than the Christian settlements; the Imam's order was awaited before the residents complied with the project. Some reluctance in accepting PHC came from the waning trust in government. In Datu Piang, Maguindanao, people were wary that fruits of livelihood projects would go to unscrupulous

pulous people. Largely, the difficulty of involving people stemmed from the problem of clarifying to them the PHC concept as an approach to health service delivery, as observed in Region VIII.

On the part of the NGOs, involvement in PHC projects depended on their interests and capabilities. Thus, while they helped fund training programmes for BHTs and helped in raising money for Botica sa Barangay and other projects, their involvement with PHC was not total nor in all cases sustained. However, in the projects where they participated, their assistance was invaluable in terms of responding to the acute needs. What could even be considered laudable was the participation of different elements in the PHC programme and the interest that they showed.

#### *Project Management*

The creation of coordinating mechanisms did not make management of the PHC programmes much easier. For instance, in monitoring the programme, the coordinators relied heavily on reports from the midwives and the BHTs which did not, in many cases, arrive on time. Evaluation was also based on field visits which the coordinators were not really able to do. Communication facilities were ineffective, such that even notices to meetings could not reach BHTs on time.

The sore lack of MOH personnel in the field made PHC administration even more difficult as the bulk of the work lay on them. In a few areas, post-board doctors and nurses augmented the staff, but not in most cases.

Also, a serious problem in getting PHC off to a smooth start is the passive attitude of some Municipal Health Officers. Considering that perhaps more than at any level, the municipal MOH staff play the pivotal role in launching projects, their less-than-enthusiastic response is a very strong constraint. Reasons for their lukewarm participation may be rooted in the conflict of interests engendered by PHC—the programme calls for less reliance on professional medical personnel and potentially threatens the private practice of physicians.

*Miscellaneous Factors*

The problem which linked all problems discussed above could best be classified under the catch word 'miscellaneous', problems caused by factors not directly administrative or economic.

One factor, as always, would be politics. The problems of complementation among agencies occurred largely because the agencies kept to their own turf and resented the integration of efforts the MOH wanted. Political factors also affected the working relationship of members of the coordinating agencies; these were expressed in non-attendance in meetings or lukewarm interest in activities, such that in some areas PHC never reached the take-off stage. This was also manifested in the direct hand some officials wielded in the selection of BHTs; in one Muslim area, the BHT chosen by the Barangay Chairman spoke only Tagalog or Visayan, so the residents found it hard to communicate to him their problems.

Despite attempts to come up with PHC projects, PHC in many places studied seemed to have been bogged down in training activities of various forms—intra and inter-sectoral workshops, training for trainers, training for PET, training for BHTs, even training for Botica aides. PHC personnel seem to be well trained, but PHC activities still leave much to be desired.

Another factor is commitment among PHC workers. Many trained 'volunteer' workers drop out, seeking incentives. In desperation, PHC coordinators are forced to replace them with untrained but more willing health workers.

A final factor is in line with educational perspectives taught in schools. It seems that for a novel programme to succeed, it needs a reorientation of attitudes of the recipients back into homegrown remedies and less expensive health delivery techniques.

**SUMMARY AND CONCLUSION**

Primary Health Care, as defined at Alma-Ata is "essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford; forms an integrated part

both of the country's health system of which it is the nucleus and of the overall social and economic development of the country".

Several aspects of this definition are worth noting:

- (a) 'essential health care' is defined to include the "promotion of proper nutrition and an adequate supply of safe water, basic sanitation; maternal and child care including family planning, immunisation against the major specific diseases; prevention and control of locally endemic diseases; education concerning prevailing health problems and the methods of preventing and controlling them; and appropriate treatment for common diseases and injuries";
- (b) the phrase "universally accessible to the population of the community" recognises health as the fundamental right of every citizen and therefore the ultimate responsibility of the state;
- (c) the provision of "means acceptable to them" implies the acceptance of traditional methods and practices;
- (d) 'full participation of the community' seeks the direct involvement of the populace in the planning, implementation and evaluation of health programmes and projects in the locality;
- (e) "at a cost the community and country can afford" recognises that resources that can be provided for health services are limited and the need to develop self-reliance in the community;
- (f) primary health care as "an integral part of the country's health system" underscores the interdependence of the local community's efforts for health care with that of the country's general health service; and
- (g) health as an "integral part of the overall socio-economic development of the country" recognises the importance of health in achieving the overall goals of development.

By way of summarizing and drawing conclusions, this section looks into these different aspects of the definition of Primary Health Care and analyses the manner in which these

were operationalised in the implementation. Discussion of these observations follow.

In the implementation of PHC in the Philippines, sufficient emphases have been put on: (a) the components of essential health care; (b) the provision of means acceptable to the people; (c) full participation of the communities; (d) the principle of self-reliance. Not too much effort and resources have been put into making medical services more accessible nor into successfully integrating the local communities' efforts for health care with that of the country's general health service. Also defective is the manner in which the concept of "health as an integral part of the overall socio-economic development of the country" is operationalised.

The definition provided for "essential health care" clearly indicates that the delivery of these services is not the sole preserve of MOH. The Nutrition Council, the MSSD and various other ministries and agencies are, in one way or another, concerned with delivery of essential health care. Further, safe water, proper nutrition, health education and basic sanitation are all directly related to incidence of disease. These make for the importance of coordination of efforts among the different agencies responsible for the delivery of these services.

At a much broader level, the need for coordination is further implied by the concept that "health is an integral part of the overall socio-economic development of the country". Coordination of efforts of agencies involved in the socio-economic development of the country are seen to be essential if achievement of the goal is to be realised.

Attempts at establishing mechanisms for coordination and complementation at the different levels of government have been discussed. It will serve well to summarise them here. These include:

1. the establishment of primary health care committees with the heads of agencies committing the agencies to the concept;
2. the establishment of technical working groups to assure coordinated efforts at implementation; and

3. integrating the PHC approach in the development plans of the various levels of government.

In addition, inter-sectoral and intra-sectoral orientations, workshops and meetings have been held to ensure that co-ordination is achieved.

In spite of these coordinating mechanisms, the case studies report difficulty in achieving coordination. Complaints of lukewarm participation or non-involvement or lack of commitment of agencies were not uncommon. In some instances even MOH personnel expressed ambivalence towards the programme.

These stem, in part, from the expectations that both MOH and other agencies have of their roles which in turn stem from different interpretations of the concept of "inter-sectoralness of health" and the "inter-sectoralness of development" in general.

On the one hand, there seems to be the interpretation that the "inter-sectoralness of health" means the agencies involved in the PHC committees are to undertake health projects in line with the approach and that these projects are under the umbrella of PHC. On the other hand, there is the interpretation among MOH personnel of the "inter-sectoralness of development" and hence the PHC approach means that health personnel are to be involved not only in health projects but in other undertakings related to community development as well. These have resulted in one or more of the following:

1. agencies feel that they have their own priorities and primary functions and that health is the problem of the MOH;
2. agencies are willing to undertake PHC projects to the extent that their own priorities/functions do not suffer;
3. agencies undertaking health-related activities report these as their contributions to PHC;
4. agencies are willing to cooperate in PHC projects by sharing manpower resources/technical expertise but financial resources are generally insufficient to run their own operations, much less to share these with other agencies;

5. health personnel feel that they should be performing health-related functions and that other functions are beyond their capabilities; and
6. energies of health personnel are channeled to other activities neglecting their own basic functions.

This study offers a suggestion on the interpretation of what makes for coordination of efforts in community development.

The barangays, in most instances, shall be the smallest planning units. In the formulation of development plans at the municipal level, the various agencies involved come together to:

- A. Identify priority barangays for development.  
The identification of barangays should, in the first place, be made on the basis of certain criteria agreed upon by the various agencies and the local government and after a coordinated survey of the barangays jointly planned and undertaken by the agencies.
- B. Conduct a barangay assembly where the agencies—
  1. explain their own concerns, roles, functions, resource availability and limitations in community development;
  2. explain the results of the survey and its implications for the development of the community;
  3. elicit participation of the community in the identification of needs, problems and issues of development in the community;
  4. elicit participation of the community in identification of resources that may be made available for community development; and
  5. plan out projects and strategies in partnership with the people.
- C. Identify their own resources that may be made available for community development.
- D. Implement the projects in partnership with the people.

- E. Discuss and solve problems of implementation together with the people.
- F. Together with the community, assess the degree of success or failure being gained by each of the projects.

The strategy laid out implies that PHC is part and parcel of the overall development of the community. Development of the community should be the rallying point and PHC a mean to achieve the goal of development. Presently, the community and the agencies are being rallied to the cause of PHC which make it seem that agencies are being used for objectives provided for by the MOH which may be one reason why agencies are more reluctant to cooperate.

While recognising health as the fundamental right of every citizen and therefore the ultimate responsibility of the State, the PHC approach has underscored the limits on resources for the delivery of health services and therefore the need to develop self-reliance in the communities. The need for self-reliance not only in the maintenance of good health but in the total development of the communities cannot be argued against. But while all-out efforts are being made to develop self-reliance (and indeed, a larger extent can be foreseen) are there similar extensive efforts to deliver both preventive and curative medicine to the disadvantaged groups?

The problems of limited manpower resources considered, has the programme adequately provided for the manner in which accessibility may be increased? The success gained in developing a sizeable number of committed citizens, the Barangay Development Workers, ensures to a large extent that preventive health programmes will be undertaken. Incidence of disease will be most likely minimised; to some extent, diseases and persons afflicted with certain diseases may be identified, but what about diseases that are not easily identifiable and functions that the BDWs cannot undertake? What about the immunisations that are needed and the X-rays, ECGs and other tests that have to be undertaken? It is not enough to develop BDWs who will motivate the communities towards self-reliance; it is equally necessary to provide for the mechanics by which the disadvantaged groups,

poor as they are, can avail of health facilities when they need them.

The provision of "means acceptable to them" has been taken to imply the acceptance of traditional methods and practices. In the implementation of the programmes this was operationalised not only to include acceptance of the use of herbs and medicinal plants to cure the sick but also the all-out campaign to undertake the project. The response has been encouraging. In many cases, the campaigns have ended with the actual planting of these; in a few cases, the campaigns included information on how to identify these different medicinal herbs and instances when they can be used; in even fewer cases, the herbs have actually been concocted to produce medicines and administered to patients.

The observations are not meant to devalue the merits gained by the various herbal garden projects. They are meant to pinpoint areas of neglect with regard to the interpretation of the concept. Two issues are here being raised. The first relates to increasing accessibility of health services to the people. The point is that traditional methods have their limitations and unless these are accompanied by efforts to increase accessibility to health services and health facilities, the benefits of improved health may be minimal.

The second issue relates to the question of "What is meant by means acceptable to them?" Traditional methods may be acceptable to some, but what about other people's desire and belief in the use of more modern medicines and Western type technology? Herbal campaigns are being conducted as if traditional methods are the only means acceptable to the disadvantaged groups. The case studies in some instances have reported resistance to the return to more traditional methods by the citizens. In cases like this, is it appropriate to insist on the use of these traditional methods? Is the herbal campaign not being overly emphasised? Would benefits of good health not accrue more if efforts were redirected to vegetable gardening instead; after all, malnutrition is shown to be one of the greatest health problems in the rural areas?

From the foregoing it seems evident that more efforts to operationalise the concept "primary health care should be an integral part of the country's health system" should be made.

The system of referral is not sufficient to ensure universal accessibility; neither is the extensive use of traditional methods. Developing mechanisms for increasing accessibility to health services and health facilities still remains a major problem that the PHC approach should address. □

## Annexure 1

## LIST OF PILOT AREAS

<i>Region</i>	<i>Province</i>	<i>Municipalities</i>
(1)	(2)	(3)
I. San Fernando, La Union	Pangasinan	Bayambang Malasiqui Mangaldan Alaminos Umingan San Nicolas Villasis
II. Tuguegarao, Cagayan	Kalinga-Apayao	Sta. Marcela Pinukpok Tabuk Pasil Rizal Flora
III. San Fernando, Pampanga	Nueva Ecija	Licab San Isidro Cuyapo Guimba I Guimba II Gapan Allaga Cabiao Talavera Palayan City Munoz
IV. Manila	Palawan	El Nido Narra Quezon Roxas

(1)	(2)	(3)
V. Legaspi City	Camarines Norte	Aborlan Butaraga Brookes Point Basual Mercedes Labo Daet Talisay Sta. Elena Jose Panganiban
VI. Iloilo City	Negros Occidental	Escalante Hunobaan La Castellana Manopla Murcia Pulupandan Sagay Villadolid Isabela
VII. Cebu City	Negros Oriental	Tanjay I Tanjay II Pamplona Valenira Sebulan Guihulgan La Libertad Siaton
VIII. Tacloban City	Eastern Samar	Dolores Llorente Can-Avid Borongan Eastern Samar Salcedo BHW Oras Guian Taft

(1)	(2)	(3)
IX. Zamboanga City	Zamboanga del Norte	Mutia Salud Manukan Osmena Liloy 3 Lindangan Salug Labason Siocon
X. Cagayan de Oro City	Agusan del Norte	Cabadbaran Buena Vista Jabonga Las Nieves Carmen Nasipit Kitcharao Gubay Magallanes Santiago
XI. Davao City	Davao Oriental	Bayambagg I Bayambang II Mati Governor Generoso Taragona Baganga Caraga Manay
XII. Cotabato City	Maguindanao	Parang Pagalungan Sultan Kudarat UPI Datu Paglis Datu Piang Maganoy

**Annexure 2****ABBREVIATIONS**

PHC	Primary Health Care
RHU	Rural Health Unit
LOI	Letter of Instruction
MHO	Municipal Health Officer
BHW	Barangay Health Worker
DW	Development Worker
MOH	Ministry of Health
PRRM	Philippine Rural Reconstruction Movement
MOH-RHO	Ministry of Health—Regional Health Office
MLGCD	Ministry of Local Government and Community Development
RDC	Regional Development Council
TWG	Technical Working Group
BHA	Barangay Health Auxiliary
RPHCC	Regional Primary Health Care Committee
POPCOM	Population Commission
SDC	Social Development Committee
NEDA	National Economic and Development Authority
PHO	Provincial Health Officer
PDC	Provincial Development Council
PIAC	Provincial Inter-Agency Committee
MSSD	Ministry of Social Services and Development
PET	Political, Educational and Technical
PHN	Public Health Nurse
PHM	Public Health Midwife
BHT	Barangay Health Technician
BVW	Barangay Volunteer Worker
PHCU	Provincial Health Care Unit
MOB	Ministry of the Budget
MA	Ministry of Agriculture
MPI	Ministry of Public Information
BAI	Bureau of Animal Industry
BFAR	Bureau of Fisheries and Aquatic Resources
BDW	Barangay Development Worker

# **DELIVERY SYSTEM FOR FAMILY PLANNING PROGRAMMES (INDONESIA)**

**BUCHARI ZAINUN**

The Family Planning Programmes in Indonesia are carried out as an integral part of The Five Year National Development Plan. These programmes have been continuously and consistently in operation for approximately fourteen years.

The goal of Family Planning Programmes in Indonesia is the acceptance of the happy and prosperous small family norm by the family as well as by the community. The Population and Family Planning Programmes have shown encouraging results as proved by the participation of 14,000,000 current users (CU) out of 23,949,319 eligible couples (ELCO = Eligible Couples at fertile age) upto January 1984.

## **IMPLEMENTATION**

In order to achieve the goal of Family Planning in Indonesia, the government has focused its programmes through three stages of activities:

- (i) the first stage stresses the acceptance of contraceptives by the community;
- (ii) the second stage focuses on the continuous utilisation of contraceptives by the family planning participants and community; and
- (iii) the last stage concentrates its efforts on the acceptance of the happy and prosperous small family norm by the community.

One of the indicators of the result of the implementation of the Population and Family Planning Programmes is the target of new acceptors and its attainment. By setting the target and monitoring its attainment, the extent of the pro-

programme activities performed so far can be observed; this also forms the basis for programme planning in the coming years. Generally the results are satisfactory in the sense that the yearly targets for 1977-78 and 1981-82 have been surpassed whereas the target for 1979-80 was not reached. Specifically, for the period of 1981-1982, 1982-83, and 1983-84, achievement in terms of new acceptors has exceeded the target. The percentages of the accomplishment against the target in each area are as follows: in Java-Bali 166.0 per cent, outside Java-Bali 120.3 per cent. The national realisation surpassed the target by 147.0 per cent.

Another indicator to know the status of the implementation of the Population and Family Planning Programmes, besides the target of new acceptors and its attainment, are the targets of current users as the number of acceptors who actually use contraceptives. In 1982 Java-Bali attained the target of 96.4 per cent, outside Java-Bali I 115.61 per cent and outside Java-Bali II 99.17 per cent. The absolute figures however are the highest for Java-Bali. (See Appendices II to IV)

### STRUCTURE

In most of the developing countries, the major responsibility for programme planning and implementation usually belongs to a singular organisation such as the Ministry of Public Health. However, in Indonesia, the responsibility is in the hand of a coordinating council, namely, the National Family Planning Coordinating Board (NFPCB). The NFPCB's responsibility is primarily for programme policy, planning, coordination, supervision and education in all aspects of the national family planning programme. In its operation, the NFPCB is supported by its branch offices at the provincial level. Beside these branch offices there are also other organisations and agencies which are actively participating for the success of the family planning programme in Indonesia. These organisations and agencies are known as the Implementing Units such as Department of Health, Department of Social Affairs, Department of Education and Culture, Department of Information, Department of Home Affairs, Department of Religious Affairs, the Indonesian

Council of Churches, the Armed Forces, the Moslem Organisation Muhammadiyah, various Women's Organisations and parties that are also executing family planning activities including the formal as well as informal local leaders (especially religious leaders), the provincial governors and other administrators.

These Implementing Units are responsible for the specific project activities in line with their areas of function and responsibility. They are obliged to send periodic reports of their activities on Family Planning to the Chairman of the NFPCB.

The responsibility of translating family planning policies and plans into action lies in the Implementing Units. The remaining portions of family planning medical services in Java and Bali are provided by the Department of Health. Maternal and Child Health (MCH) and family planning functions are the responsibility of a special directorate in the Department of Health.

Under the technical guidance and policy laid down by the Department of Health and operationally supervised by the Provincial Health Services, MCH and family planning services are given also at district, sub-district and village levels.

Medical facilities are also supplemented by hospitals and clinics run by the Public Enterprises, the Armed Forces and Police which are open to public and by private hospitals and clinics run by the Christian Council of Churches and the Moslem Organisation of Muhammadiyah.

Although no final decisions have been made, there is an informal agreement between the Indonesian Family Planning Association (IFPA) and the Government that, in Java and Bali, IFPA will play its part in developing and providing training, research and information facilities. In the outer islands, IFPA will still be responsible for almost every aspect of family planning activities. The main problem of organisation is weakness in relationship and communication between the NFPCB and the Implementing Units at the Central and local levels. The problem is due to the weak administrative component of the NFPCB's organisation for carrying out the coordination. For the purpose of development of the NFPCB's coordinating role, a modification of the organisation

structure and specification has been done in 1975 so as to achieve a more effective focus on planning, budgeting, programming, supervision and evaluation. Various management training programmes for the personnel and officials of the NFPCB have also been conducted to meet the challenging situation faced by the Family Planning Programme in Indonesia.

### DELIVERY SYSTEM

The success of the Population and Family Planning Programme depends very much on the adequacy of the delivery facilities, such as the family planning clinics, village contraceptive distribution centres and many other institutions. In March 1982, the contraceptive facilities showed high numbers, namely, 7,042 (4.1%) Family Planning Clinics, 44,352 (29.8%) PPKBD (Village Distribution Centres), and 98,355 (66.1%) Sub PPKBD (Sub Village Distribution Centres). Within the last ten years, 1974 to 1984 (end of March), the total number of Family Planning Clinics has more than tripled (there were only 2,235 Family Planning Clinics in 1974.).

#### *Use of Maternal and Child Health (MCH) Services*

The facilities and personnel of the Department of Health's MCH are used to deliver 80 per cent of the family planning services. Services are also delivered by MCH centres run by the Public Enterprises, the Armed Forces, voluntary organisations, agricultural and industrial estates and doctors and midwives through their private practice.

Most of the family planning women acceptors hear about family planning from the MCH staff. Of a sample of new acceptors in the first quarter of 1983, 65 per cent were referred by health workers, 15 per cent by friends who have been using contraceptive methods, and 20 per cent by field workers. The midwife is an important element of the health workers and presently the principal contact with potential acceptors.

The contraceptive methods are offered at MCH centres or other clinics, either at special sessions or as a routine part of the MCH programme. The programme is female oriented with about 82.3 per cent of new acceptors using either IUD

or pill (IUD=27.4 per cent and pill=54.9 per cent); remaining acceptors use Condom=4.9 per cent, Injectable=9.7 per cent and others=3.1 per cent (See Appendix I).

MCH facilities at village level are rudimentary. For an average village of 2,800 people, there is usually a simple MCH centre built by the community and visited perhaps twice a month by a midwife but rarely by a doctor. At the Sub District level with a typical population of 44,000, there may be a permanently manned MCH center with a trained government midwife in charge; some may have more than one MCH center. At a location with a group of five Sub-Districts, there is a provincial sub-unit for health services headed by a medical officer.

In large cities, the ratio of government MCH centres to the population is lower than in rural areas, but they are served by a great number of private health and maternal care facilities. In the city of Surabaya for example, the ratio is 1:85,000 for government centres, but 1:35,000 when private centres are taken into account. In small towns, the ratio is much better such as in East Java where the ratio is 1:25,000. Maternity centres play important roles in a big city such as in Jakarta. During 1983, 60 per cent of the 310,000 deliveries were reported from maternity centres.

Because acceptors now use mainly contraceptive methods, they require much attention of trained medical and paramedical staff in health centres. An improvement in the basic delivery services provided through the MCH programme are critically important for the success of the family planning programme.

There are at least three serious constraints *vis-a-vis* improvement of the MCH services.

### *The Shortage of Midwives*

The number of midwifery schools in Java and Bali are unable to produce enough trained and educated midwives needed to fill the number of jobs. With the total number of 44 midwifery schools, it has been roughly estimated that for existing MCH centres, maternity hospital and health centres there exists a shortage of 500 midwives for the province of East Java and a shortage of 700 for Metropolitan Jakarta.

In East Java, the number of midwives gives a ratio of 1:33,000. But in Bali the ratio is 1:12,502. The ratio of government salaried midwives working in MCH centres and therefore available for delivery of family planning services is around 1:45,000. This is extremely low and indicates a need for at least twice as many midwives as presently employed. The improvement of the training facilities to be able to supply a sufficient number of graduates is widely desired.

#### *Inadequate Building Facilities*

There is a great need for adequate building facilities to provide services. The fact of irregular provision and distribution of family planning services indicates that wide areas of the country are inadequately served. Many existing centres are locally built of poor materials and others occupy rented accommodation. The village MCH center is often a room of a house rented for two afternoons in a month and used as a dwelling for the rest of the time.

In a survey made in May 1981 of family planning clinics using MCH centres in East Java, nearly 90 per cent needed new buildings or extensive renovations to bring them up to the standard norms of space and facilities. By the end of 1983, these conditions had been improved to 62 per cent.

#### *Inadequate Bed Facilities for Maternity Services*

Maternity bed facility in the large cities like Jakarta and Surabaya can only provide for 60 per cent of deliveries. Although at the end of 1983 the average number of deliveries per bed in Jakarta in all maternity facilities was 51, the rate of over 80 per bed for public maternity facilities is well over the acceptable rate of 60 deliveries per bed annually. The decentralisation of maternity facilities to smaller 20-bed units in the suburb areas of Jakarta and Surabaya is proceeding, but in Surabaya, for example, only 3 out of 16 MCH centre have been provided with such units. They have, however, proved successful in providing better coverage of maternity services and greatly expanded opportunity for family planning motivation by providing information and services. For small town and rural areas, however, there are presently only some

20 beds provided for maternity cases in an area a bit larger than the District.

### *Hospital Post Partum Programme*

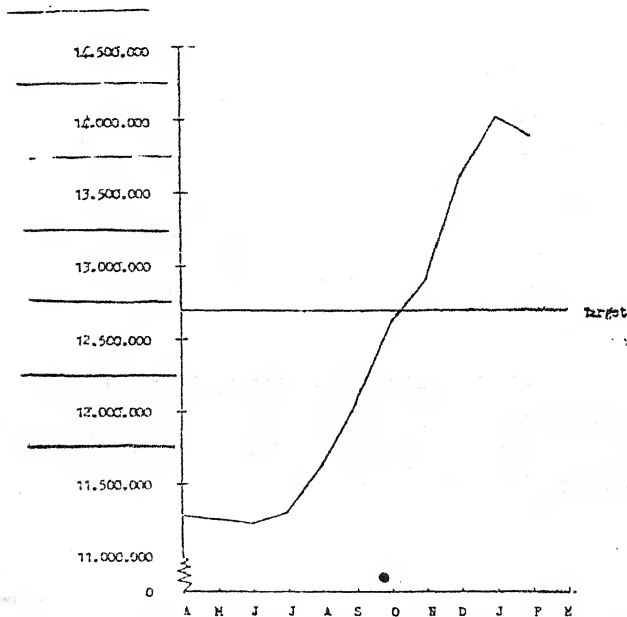
In July 1972 the NFPCB asked the Department of Health and the Armed Forces Medical Services to implement the Hospital Postpartum Family Planning Programme.

During the FY 1972-73 the hospital postpartum programme was implemented in 26 hospitals and 28,546 new acceptors were obtained which represents 35 per cent of the total deliveries and abortions. For the fiscal year 1982/1983 the total number of new acceptors has reached 75 per cent of the total deliveries and abortions. The reason for this is the continuous effort for the improvement of the delivery system at all levels of the organisation.

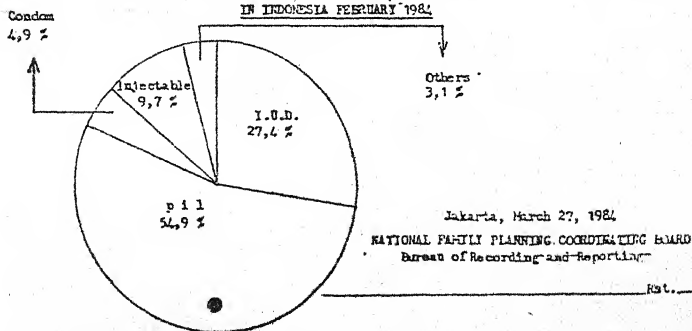
The crucial elements for successful implementation of the Family Planning programmes are financing and budgeting which determine the volume of material and human resources available for programme implementation and the level of motivation, skill and knowledge of Family Planning workers and staff members. The allocation of financial resources would be linked to mechanisms of resource mobilisation. At the beginning, Indonesian Family Planning programmes tended to rely heavily on foreign resources. Since 1979, domestic resources have been mobilised and foreign aid has become a secondary source in the Family Planning Programmes in Indonesia. A large portion of both financial and manpower resources have been allocated for direct services to clientele such as delivery of Family Planning contraceptives at the field level. For raising the efficiency of programme performance, the NFPCB has spent more money and has more staff in the field rather than at the centre. But now, the critical unresolved problem is the low incentive given to the field workers by the family planning programmes in the rural areas. □

## APPENDIX 1

TOTAL NUMBER OF CURRENT USERS BY MONTH  
IN INDONESIA 1983/84

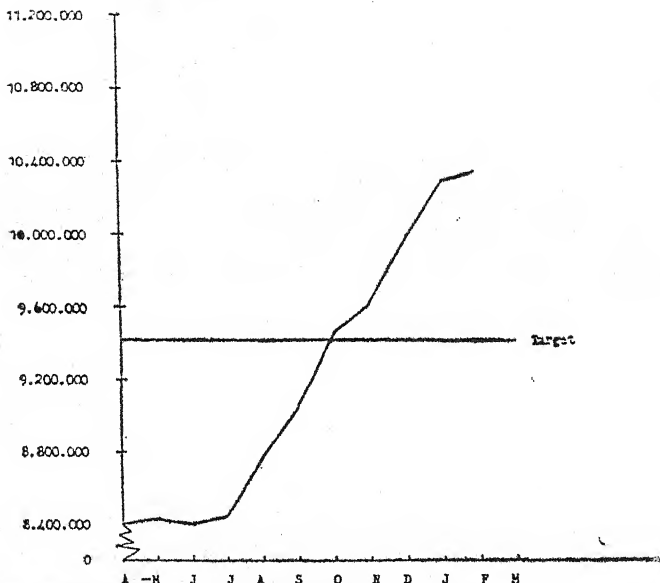


THE ESTIMATION OF PREVALENCE RATE BY METHOD  
IN INDONESIA FEBRUARY 1984

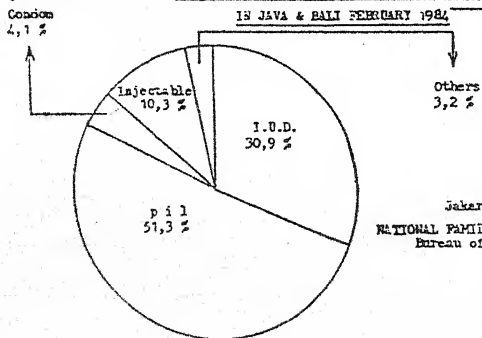


## APPENDIX 2

TOTAL NUMBER OF CURRENT USERS BY MONTH  
IN JAVA & BALI 1983/1984



THE ESTIMATION OF PREVALENCE RATE BY METHOD  
IN JAVA & BALI FEBRUARY 1984



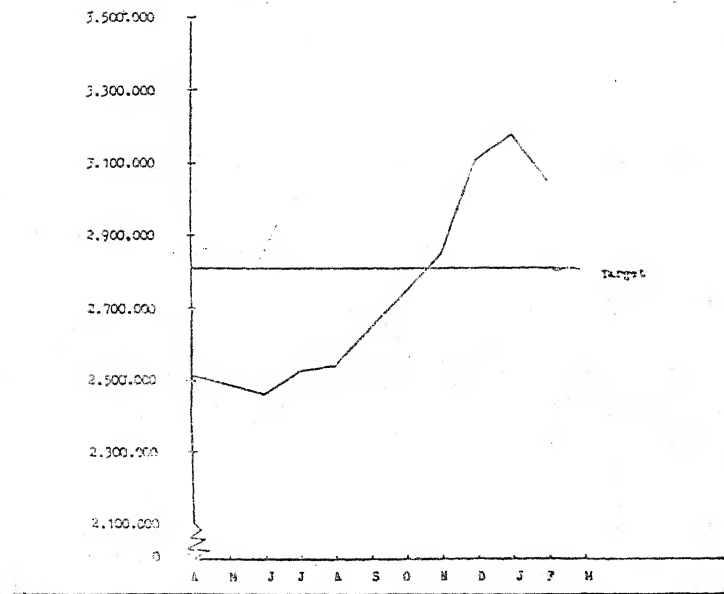
Jakarta, March 27, 1984  
 NATIONAL FAMILY PLANNING COORDINATING BOARD  
 Bureau of Recording and Reporting

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# APPENDIX 3

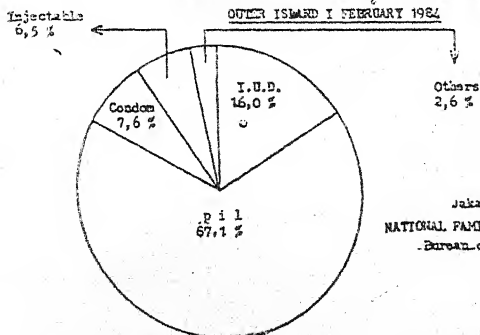
## TOTAL NUMBER OF CURRENT USERS BY MONTH

OUTER ISLAND I 1983/84



## THE ESTIMATION OF PREVALENCE RATE BY METHOD

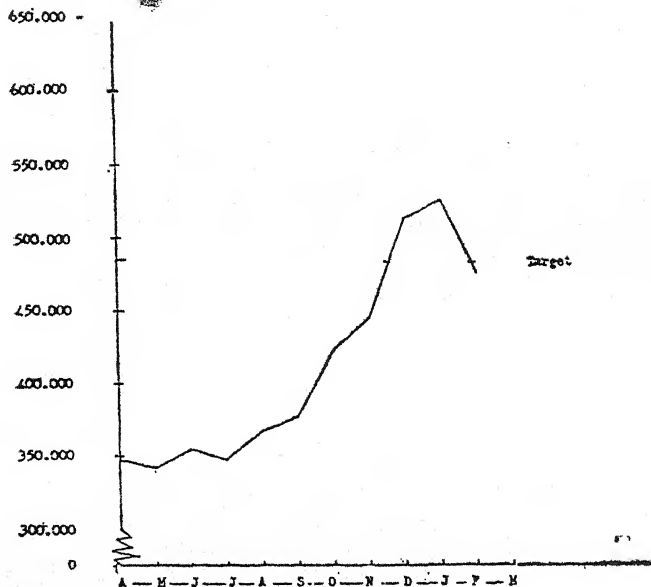
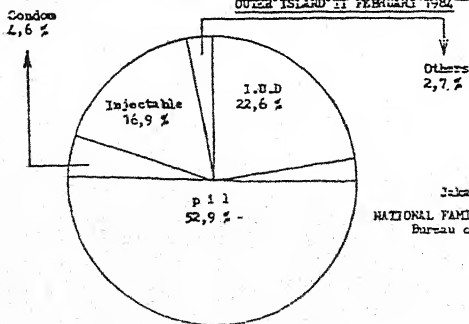
OUTER ISLAND I FEBRUARY 1984



Jakarta, March 27, 1984

NATIONAL FAMILY PLANNING COORDINATING BOARD  
Bureau of Recording and Reporting

## APPENDIX 4

TOTAL NUMBER OF CURRENT USERS BY MONTHOUTER ISLAND II 1983/84THE ESTIMATION OF PREVALENCE RATE BY METHODOUTER ISLAND II FEBRUARY 1984

Jakarta March 27, 1984  
 NATIONAL FAMILY PLANNING COORDINATING BOARD  
 Bureau of Recording and Reporting

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# DELIVERY SYSTEM FOR NON-FORMAL EDUCATION (THAILAND)

BOONTON DOCKTHAISONG

After the abolition of absolute monarchy in Thailand in 1932, along with the basic policies of national security, independence of the judiciary, economic opportunities/jobs for all, equality for all and freedom with social justice, the Government of Thailand adopted the policy of education for all.

Earlier, educational opportunities had gone primarily to the elites, the nobility and members of the royal family. The revolution brought about the possibility of provision of educational opportunities to the masses. The government was appreciative of the philosophy that the basic source of all national development is the intelligence and energy of the people. The challenge of mass education, therefore, and the removal of the chains of illiteracy which still imprisoned a significant proportion of its population became an issue of vital significance.

However, in spite of Thailand's well developed formal educational system\* and the adult education programme

\*Thailand has 16 universities including 2 Buddhist universities. There are also about 60 colleges according to their specialised field. The secondary schools both government and private are situated in the provinces and districts throughout Thailand. The primary schools (from grades 1 to 6) are compulsory and are located in every urban area and nearly every village throughout Thailand.

There are two open universities, Ramkhamhaeng University with its own campus and Sukothai Thamatirach University which particularly provides long distance education by full use of all types of mass media. Students receive educational materials at home and are offered both degree and non-degree programmes. There is no age barrier for admission. This university is considered to be the adult university in which anyone who wants to learn can learn. Many programmes are especially designed for leaders in the local areas such as village chiefs and commune leaders as well as for the villagers themselves.

which has been in existence for over four and a half decades (unfortunately, this was primarily urban centered and financially out of bounds as far as the really needy mass of rural poor or even urban poor were concerned) the objective of education for all remained far from being achieved and education remained in the hands of the few. Finally, in 1972, a department of non-formal education (NFE) was created in the ministry of education (see Appendix 1). New hopes were kindled of effectively meeting the continuing challenge of mass illiteracy but it is only now, towards the middle of the nineteen eighties, that substantial progress has begun to occur in the quest to share with all its citizens (about fifty million in 1983) and, particularly with the under-privileged, the light and strength of basic education, literacy, numeracy, and vocational knowledge and skills. In the ultimate analysis, it is only education and training that can help the poor to become self-aware and self-reliant, to organise themselves to fight the exploitation to which they are continuously subjected and to make a much greater contribution to national well being and development through the fuller realisation of their practically unlimited and untapped inherent potentials.

The fourth national socio-economic development plan (1977-81) put renewed emphasis on the policy of education for all with particular concern for reaching the poor in the rural areas. The fifth national development plan (1982-86) has been designed to completely eradicate national poverty, promote equality of opportunity and income for the rural population and build the abilities of the rural poor by all means. For meeting the challenge of substantially reducing the problem of illiteracy, the primary responsibility has been placed on the ministry of education, especially, on its department of non-formal education. It is expected that by the end of the fifth plan period in 1986, the non-formal education programme will be successful in achieving a drastic reduction in the number of illiterate persons in Thailand (presently estimated at about fifteen per cent of the population). Hopefully, there would then be only about one million persons still to be brought out from the crippling darkness of illiteracy.

OBJECTIVES OF THE NON-FORMAL EDUCATION  
SYSTEM

*General Objective*

The general objective of the non-formal education (NFE) system is to provide an opportunity to the population from the age of 14 to 55 to learn how to read and write.

*Specific Objectives*

These are:

- (a) to develop the potential of the people and their ability for reading and writing and to develop in them an attitude of love for the habit of reading;
- (b) to persuade and assist the illiterate people to develop their vocational skills and to read and seek for modern knowledge; and
- (c) to encourage the people to help and cooperate with each other in order to develop their own community.

*Operational Strategy of NFE*

The basic operational strategy to provide for the learning needs of the people is as follows:

- (a) to optimally utilise all national resources such as governmental agencies, private sector organisations and individuals;
- (b) to encourage students, learned men, temple novices and monks to campaign for the eradication of illiteracy by voluntary effort and means; and
- (c) to employ all forms of mass media for the transmission of non-formal education and for the communication of developmental information to the public.

TARGET GROUPS OF NFE

The major target groups of non-formal education are:

1. adults who somehow lost the opportunity to study in school in the formal education system;
2. persons who are unable to continue their study in the

formal education system either in the urban or the rural areas; and

3. people living in the remote areas engaged primarily in farm production and animal husbandry and who may have relapsed into illiteracy and so cannot read to recall the subject matter or read new information for improving the productivity of their activities.

#### ORGANISATIONAL STRUCTURE FOR NFE

The chart given in Appendix 1 depicts the organisation structure of the non-formal education system in Thailand.

The organisational chart shows the seven divisions which are located in the ministry of education. The map (see Appendix 2) shows the distribution of regional and provincial centres for non-formal education. The process of establishing a network of cooperative linkages with other governmental agencies and private sector organisations is in progress.

#### THE NON-FORMAL EDUCATION PROGRAMME

Many programmes and activities have been designed to increase the number of literates and their occupational skills so as to improve their standard of living and their quality of life. The major pilot projects are given in Appendix 3. They are as follows:

##### *Adult General Education*

This programme will enable the learners to study in order to get a certificate equivalent to the normal education. They usually study in the evening. The department of non-formal education provides courses for both the primary and secondary education levels. A comparison of the time taken in non-formal education *vis-a-vis* formal education is given in Appendix 4.

##### *Vocational Adult Education*

This programme provides occupational skills through short duration courses. Fixed and mobile units give training in various vocational subjects according to need. There are two

types of vocational schools:

- (a) Stationary vocational schools are vocational adult education schools held in day schools. They offer courses for 100-300 hours. The subjects of concentration are industry, home economics, business and agriculture.
- (b) Mobile vocational schools include mobile adult schools and mobile trade training schools. Mobile adult schools are small mobile units dispatched to serve the localities in the remote areas. Courses last for 150-300 hours. The courses offered are dress making, tailoring, hair dressing, mechanics, and agriculture. Mobile trade training schools are mobile units designed to service people in high density areas. The subjects are mainly focused on industrial vocations such as mechanics, radio repairer, electrician, welder, tailor, etc. Classes are offered from 9.00-12.00, 1.00-4.00 p.m., and 5.00-8.00 p.m. Courses are of about 400 hours. Presently, the mobile vocational training schools offer various subjects in remote rural areas under the administration of the mobile occupational training for rural people project.

### *The Interest Groups Programme*

This programme caters to the initiative and innovation of the local people who need to study in the field of their interests for the benefit of themselves and their community. The provincial centre for non-formal education will be responsible for arranging for the teaching staff. The maximum teaching hours in one course may be 5-30 hours; it depends on the subject. This project has been operating since 1973. It is very interesting that the people in all regions are interested and the programme is widely popular in every province. Action may be initiated in two ways: (i) the officials in each province survey local needs and randomly select at least fifteen persons who wish to study a particular subject. The provincial authorities or the central non-formal authorities will provide the required resources. The government will pay the teacher about one and a half dollar or 30 baht per hour; and (ii) a

minimum of fifteen people interested in learning a particular subject(s) may request the officials for approval to open courses. However, the learners must be clear about what they want to study for example, how to develop local fertilisers, brick making, mushroom cultivation, etc.

### *Public Libraries*

The government offers libraries to promote the habit of reading, to encourage profitable use of leisure time and also for disseminating up-to-date news and current information. Now-a-days, there are many types of public libraries, such as, provincial public library, district public library, and mobile libraries. The mobile libraries are mobile van units moving around communities and mobile boat units sailing along rivers, such as, Chao Praya and Bank-Pakong rivers.

### *Functional Literacy Programme*

This programme provides training for illiterates including an increasing knowledge of their own society and environment and for improving their problem-solving and decision-making abilities. The department of non-formal education has surveyed and studied the local problems, local interests and needs so as to keep them in view while designing the curriculum. The learning-teaching activities may be conducted in schools, temples, or even at the learner's house. The learners and teachers will discuss their needs and local problems together and find out the best solution to meet the appropriate needs of each area or each person.

### *Educational Audio-visual Unit*

The main functions of the audio-visual unit are bringing news and information to the people in the remote areas for the purpose of bridging misunderstandings between the people and between the government and the people. Usually, people enjoy seeing movies. The audio-visual unit sets the date of visiting. On the meeting day, the officials will show them the educational films and slides. This project brings about better understanding and good feeling for one another. However, there is only one audio-visual unit in each province.

### *Mass Media for Adult Education*

The mass media is a powerful resource for the transmission of educational information to the rural people at home. The government statistical data show that approximately 80 per cent of people are out of school. Therefore, it is a very difficult task to provide them education. The department has offered mass media education, together with other kinds of adult education, such as, education by radio and newspapers, in the fields which are useful for improving the daily life of the people.

One activity is a publication called *Adult Education News*. It aims at extending knowledge concerning vocational guidance, health, nutrition, family planning and the laws related to daily life. It also covers social education, Thai culture and traditions. The interesting information is written in simple language and in the form of stories which can be beneficially applied to everyday life. The *Adult Education News* is in the form of a wall newspaper which is printed every two weeks and sent to village newspaper-reading centres, temples, district offices, village headman, health centres and every adult school throughout the country. The radio and television programmes are sending beneficial information to the public dealing with living conditions, the current market situation, the price of agricultural products, the economic situation, etc.

### *Non-formal Education Through Radio and Correspondence*

The centre for education technology of the department of non-formal education together with the public relations department are responsible for the radio programme. Educational information is sent to the learners through radio transmission while the educational materials are mailed to them.

Learners listen to the radio and study the correspondence materials and follow up according to the prescribed activities or by meeting with their teacher in a group atleast for 3 hours a week or the students have to follow up the information according to the schedules.

*Village Newspaper Reading Centre*

According to the research survey on illiteracy, about 80 per cent of rural people are literate but have no opportunity to continue their education after they finished primary school (grade 4). Then they rarely read books and eventually many relapse into illiteracy due to the nature of their occupation, mainly agriculture and farming. This situation brings them loss in their business transaction with the middlemen. They become slaves to the local elites who get advantage over them and their products and goods, and they also fall prey to evil instigation and deceit. Usually, the rural farmers hold the lowest rank in the Thai social stratificational ladders. A Thai motto states that:

If there are no poor skinny farmers who are under poverty, starvation, malnutrition and debt, there are no rich middlemen.

Indeed, in underdeveloped societies, there is one thing in common; that is, the rich exploit the poor. This aroused the government to launch a pilot project to acquire books and documents for the rural people by establishing village newspaper reading centres. Along with these were established centres for book donations such as children's books, textbooks, periodicals, supplementary reading and vocational books for distribution to the urgently needy villages in the remote areas.

*Provincial Non-formal Education Centres*

The provincial NFE centres are responsible to help the province in administering NFE's activities and for coordinating and facilitating cooperation of private and governmental agencies. NFE has established centres at various levels for accommodating the educational facilities required for the betterment of learners. (See Appendix 5)

*Centre for Educational Technology*

This centre provides educational information to the public particularly through the use of radio and audiovisual communications—TV, film strips, etc. It is also responsible for facilitating research and innovations which would go a long

way towards dramatically improving the educational process for meeting the challenge of mass education in Thailand in a more effective and time and cost efficient manner.

*Action Plan for Non-formal Education Department*

The table given below provides a numerical portrayal of the action plan of the NFE department during the coming few years. A massive thrust of NFE into the villages, where the need is greatest, is the key feature of this proposed plan. We may also note the rapid growth in the number of illiterate persons who would be receiving services directly through the NFE department.

NUMERICAL PORTRAYAL OF ACTION PLAN OF NFE  
DEPARTMENT

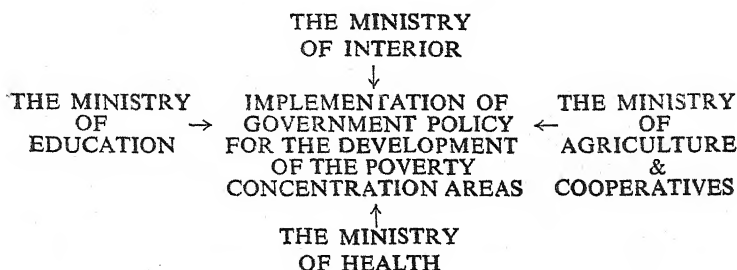
<i>Years</i>	<i>Provinces</i>	<i>Districts</i>	<i>Villages</i>	<i>The Incremental learners</i>
1983	8	39	4,417	100,000
1984	18	459	30,725	300,000
1985	52	698	51,566	500,000
1986	73	698	51,566	600,000
Total	73	698	51,566	1,500,000

ADMINISTRATION OF THE NON-FORMAL EDUCATION  
PROGRAMME

By 1981, the Thai government had developed the NFE pilot projects for the purpose of operationalising a new paradigm in education for national development and for the implementation of the new policy which focused on the development of poverty concentration areas throughout the poorest and the remotest areas of Thailand.

For the purpose of policy formulation and coordination, at the apex level, there is the office of the Prime Minister. At the next level, integrated cooperation among four key ministries is required for effective implementation of the government policy in the poverty areas. These ministries are: the ministry of education, the ministry of interior, the ministry of agriculture and cooperatives and the ministry of health.

The figure below depicts the key ministries:



These four ministries are the key governmental agents of planned action for meeting the urgent developmental challenge of transforming the quality of consciousness and life—physical, emotional, mental, social, political and economic—of the underprivileged poor of Thailand.

However, though plans are well defined, integration in implementation does not function according to plan due to the nature of governmental bureaucracy. Of course, each ministry has to overcome its own difficulties, especially the typical problems of limited financial and human resources. That apart, each ministry has its centres located in all parts of Thailand and each ministry communicates the policy and implements it through its own administrative organisation in the local areas. Thus, the ministry of interior has agents at the district, commune, and village; the ministry of agriculture and cooperatives also has its agents at district and commune levels; the ministry of health and the ministry of education have their respective organisations. Particularly, the system of education for formal compulsory education up to grade 6 is situated in almost every Thai village. The tradition of isolated functioning and rigid boundaries makes inter-ministerial coordination, let alone cooperation and integration, quite difficult. Much more thought and effort will have to be given in the coming years to prevent the losses due to wasteful fragmentation and suboptimal utilisation of collective resources—human and non-human—and to meet the challenge of creating a holistic, mutually reinforcing, synergic delivery system particularly, at the district, subdistrict,

commune and village levels.

Earlier, we had mentioned the general problem of limited financial resources. This is a substantial barrier to the effective implementation of government policy meant for the upliftment of the really needy under privileged people and arises from the system of budgeting arrangements. Security is the main theme of leaders in the developing nations which means that the arrangement of the national budget is focused on defence particularly, on the buying of sophisticated weapons. Thus, every year, defence expenditures take up about 30 per cent of the national budget. This is the real cause of an improper national budgetary arrangement.

If we could adopt a new concept of the meaning of security and appreciate the real foundations of national security—the health, intelligence and cooperation of the common people—we could redirect a major proportion of these resources into socio-economic development and make enormous impact on the eradication of poverty and illiteracy. The budgets for education, health and agriculture would then reflect their rightful place as the frontline of national security and development.

The other general problem of limited human resources is really more than the problem of low motivation. The reward structure of governmental organisations will have to be greatly modified and field jobs like delivering education and health care in the remote areas will have to be given their rightful share of importance. If the way to professional advancement comes more through contact with the boss in the headquarters/central offices, then the motivation for the truly significant developmental tasks in the communes and villages will, by and large, just not get created. Present-day administrative delivery systems have to greatly reform their basic philosophy and reward structures if they really mean business when they talk of serving the people and more so, the poor.

Let us return now to the theme of cooperation between the four ministries mentioned earlier. This concept has been created by our Prime Minister, General Prem Tinsulanonda, his advisers and our national level planners. It is grounded in a philosophy of national development which is appreciative of the interrelatedness of the problems of the poor, that the

vicious circle of poverty, illiteracy, malnutrition and ill-health, dysfunctional pattern of land distribution with no land for the tiller, low farm productivity, socio-economic oppression and exploitation and inequality of opportunity and income has to be attacked on all fronts simultaneously. The main objective of the new policy is to generate national resources to meet the needs of the rural people and, in particular, of those in poverty concentration areas.

Therefore, the basic design of the administrative organisation is that the four ministries are to cooperate and function as a single integrated organ for carrying out the policy of rural development and particularly, the upliftment of the rural poor in the absolute poverty areas.

In order to provide cooperative linkage at all levels, the following committees have been created:

1. The Central Committee for Rural Development attached to the office of the Prime Minister.
2. Committees for Rural Development at the provincial level.
3. Committees for Rural Development at the district level.
4. Committees for Rural Development at the commune level.
5. Committees for Rural Development at the village level.

These committees are linking pin organisations to plan and organise for the performance of the important tasks of rural development by integrated utilisation of the specialised services of the four ministries for the benefit of the rural poor.

#### OVERVIEW

Education is the most basic resource for national development. If the people of a nation have good education, know-how and skill, the nation will develop socio-economically, politically and culturally.

The task of the department of non-formal education is to eradicate national illiteracy, *i.e.*, to assist the illiterate poor from both the urban and rural areas to get out of the darkness and imprisonment of illiteracy into the light and freedom of literacy. The task is formidable because lack of education and poverty go together—the uneducated are poor, the poor

are uneducated. The problem is particularly serious in the rural areas and even more so in the more backward and more remote rural areas, in the areas of absolute poverty.

In the rural areas, when the people knowhow to read and write, it will help them to have better understanding of government policy and their rights and the value of their products. They will be able to read the directions for the use of medicines. They will be able to read the directions for the application of fertiliser and other inputs so as to raise the productivity of their farms. Therefore, the pilot project of helping those who cannot read and write has tremendous practical value for the rural people. They will become more able to take care of themselves. They will be able to stop their day-to-day exploitation by the trader and the local elite. They will be able to save themselves from the trap of the money-leader and his usurious interest rate which often ends in the confiscation of his land by the money-lender. When the farmer loses his land, he has lost everything. If the national non-formal education programme can help the rural poor, even to a small degree, to be able to read so that they do not become 'voluntary' signatories to their own economic death sentences, to be able to count so that they do not get fleeced, to be able to gain in self-reliance and the ability to join hands with each other and organise co-operatives, then it will have made a very big contribution to the development of our nation.

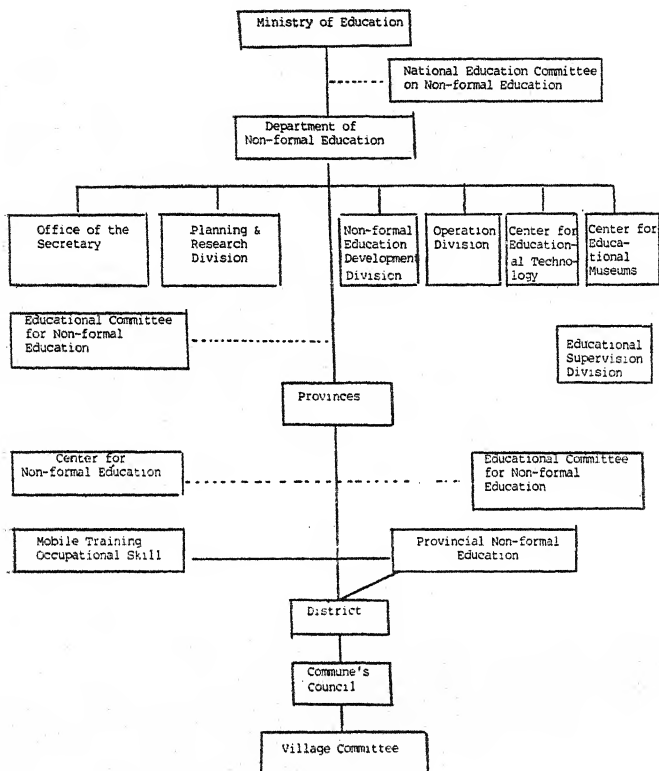
In conclusion, given below are a few recommendations with regard to the administration of our non-formal education programme:

1. The department of non-formal education should closely associate and cooperate with all the primary schools situated in the villages by sending the department's personnel to live and work in the school and village. If the school has no budget for this, the department should provide the necessary material and financial resources to the primary schools. The headmaster will be responsible for the distribution of teaching materials and for arranging for the teaching inputs required by the school's extension programmes.

2. The department should select the temple as the headquarters of mass learning. The monks and novices will willingly accept the responsibility for teaching and thus strengthening their traditional role of being the primary educationists of the Thai people and more so, of the poor.
3. Secondary schools in Thailand have been taking the added responsibility for providing adult education over the past several decades. Secondary school teachers have used the school's facilities to offer evening courses in general education at the levels of primary school grades 1 to 6 and also at the lower secondary school levels. The department of non-formal education should channel its resources to strengthen these institutions and transform them from being reasonably good providers of adult general education into delivery systems of excellence and major contributors to the implementation of the new policy of eradication of national illiteracy by the end of the present national development plan, *i.e.*, by 1986. It would be highly wasteful and dysfunctional if the department of non-formal education attempted to use its resources to duplicate the secondary schools' facilities and teachers. The right thing to do is to create closer linkages with the already well established formal school system in Thailand and contribute resources for its further expansion and more effective functioning.
4. Radio and television are extremely powerful resources for mass education. If the programmes provide occupational knowledge, demonstrate vocational skills, show the way to preserve one's health, explain the duties of the people towards each other, emphasise the responsibility to learn for the benefit of themselves and the nation, they can awaken, encourage and stimulate the people to look for ways to increase their ability to learn, to improve themselves and build their quality of individual and collective life. Fuller and more effective utilisation should be made of the resources of mass media.

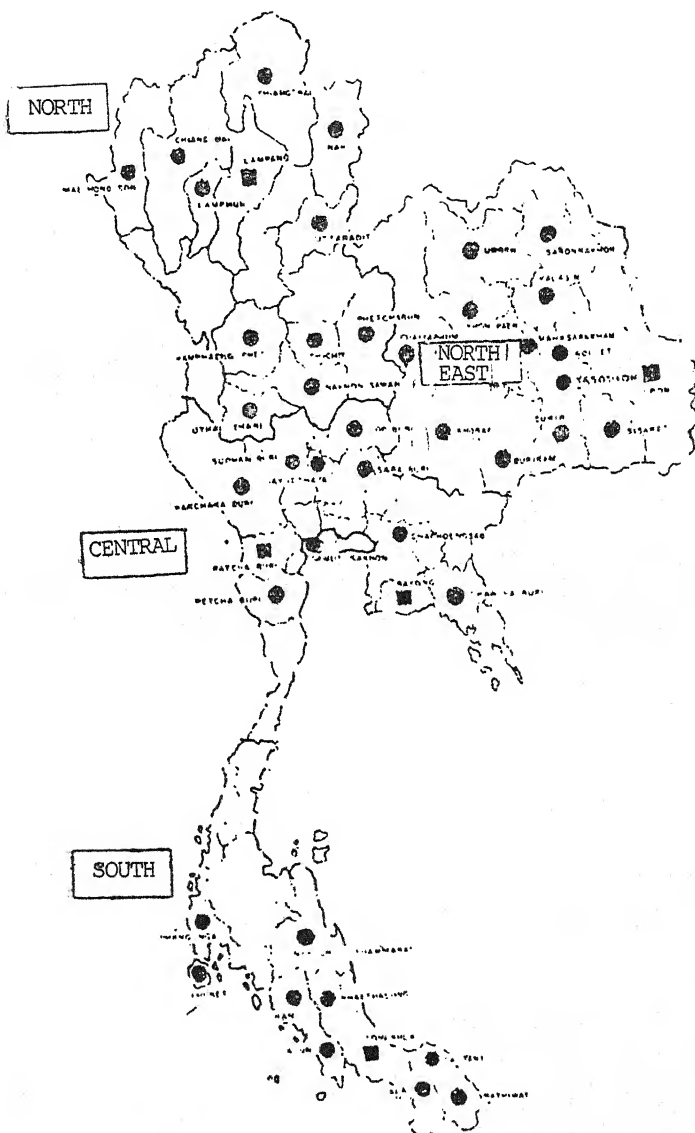
5. The department of non-formal education should strengthen local agencies, voluntary organisations and local personnel. These are very important resources and they should be encouraged and assisted to become joint partners of the department in its challenging responsibility for achieving hundred per cent literacy and thus to make a major contribution to the process of building a genuinely advanced nation.

## Appendix 1



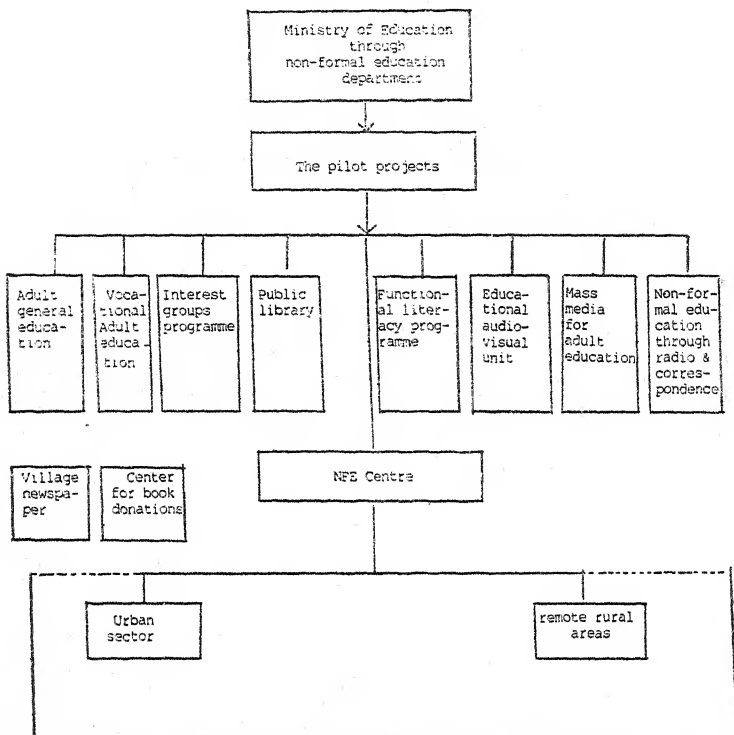
SOURCE: Ministry of Education - adapted by Boonton, Dockthaisong.

# Appendix 2



- Center of Provincial non-formal education
- Center of Regional non-formal education

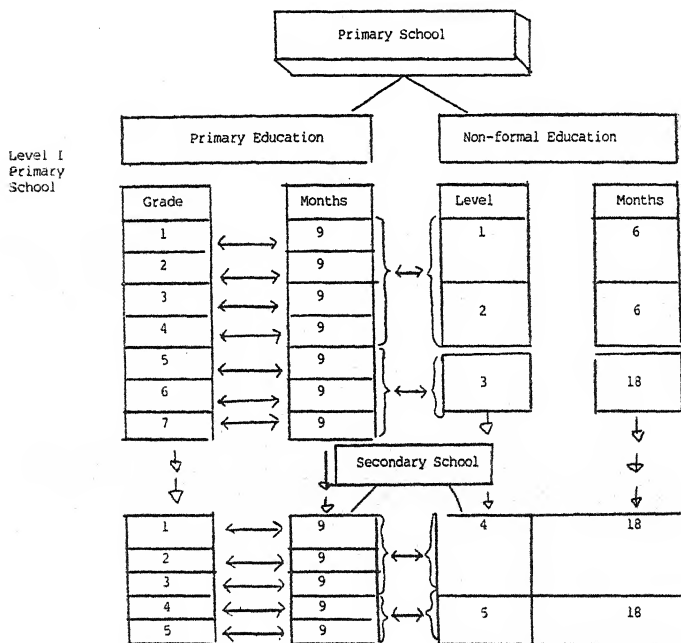
## Appendix 3



SOURCE: Ministry of Education - adapted by Boonton Dockthaisong.

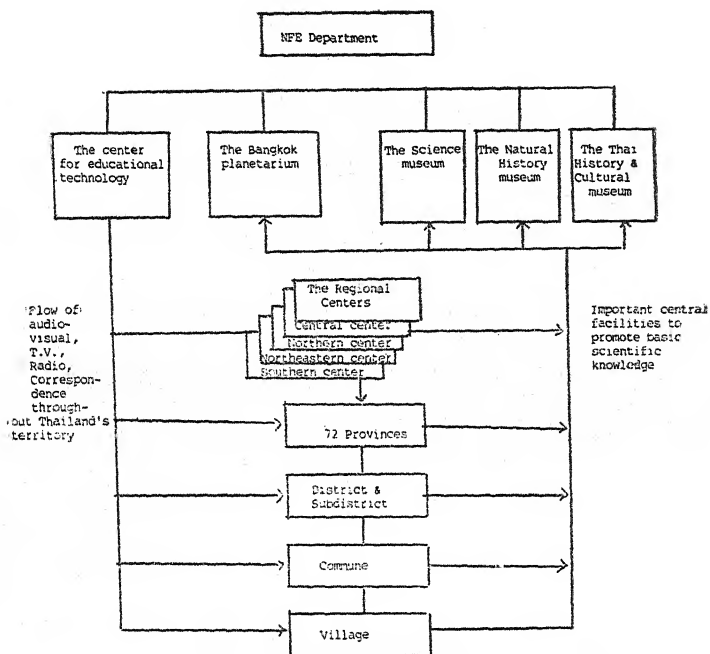
## Appendix 4

Comparison between Time of Study in Formal and Non-formal Education



SOURCE: Department of Non-formal Education, Ministry of Education - adapted by Boonton Dockthaisong.

## Appendix 5



## DELIVERY SYSTEM FOR HYBRID SEEDS PRODUCTION (INDIA)

P.R. DUBHASHI

A significant breakthrough in agricultural technology and organisation has for long been the principal objective of Indian planning. A scheme on which much reliance has been placed for the realisation of this objective has been the production and distribution of hybrid seed. It is this scheme and the process of its implementation in the office of the Director of Agriculture of Maharashtra State that forms the subject matter of the present case study. The programme for the production and multiplication of high-yielding hybrid seed is of a complex character, involving as it does the activities of a large number of scattered individual units as also requiring a unique combination of technical meticulousness and administrative drive.

Use of improved seeds was accepted as one of the important measures in the plan-programme for stepping up agricultural production in the country. According to the accepted procedure of the scheme, nucleus or breeder seed produced in agricultural research stations and sub-stations was to be multiplied on the *Taluka* Seed Multiplication Farms. The resultant produce known as foundation seed was further multiplied in the fields of registered seed growers for eventual general distribution as improved seed. In Maharashtra, the scheme for multiplication and distribution of improved seed was worked in the state sector up to the stage of production of foundation seed and thereafter, it was implemented by the *Zilla Parishads*. The *Zilla Parishads* were expected to obtain foundation seed from the seed farms, supply them to the registered growers and arrange to procure improved seed for distribution amongst the cultivators. Ordinarily, the work of

distribution of improved seeds was to be done by the co-operative societies.

#### NSC'S ATTEMPTS TO POPULARISE THE SCHEME

The Union Government established the National Seeds Corporation (NSC) in 1963 to act as the spearhead of the programme of production and distribution of hybrid seed. Though the formal date of establishment of NSC was 1963, it had been functioning informally even since 1962. The Corporation concentrated in the initial years on hybrid maize. The General Manager of the Corporation wrote on August 30, 1963 to the Director of Agriculture, Maharashtra State, Poona, that "the production of hybrid maize all over the country is being looked after by NSC and Maharashtra has been considered suitable for its production." The letter also indicated the criteria for the selection of seed growers. In a continuing letter, dated September 9, 1963, NSC pointed out: "The present programme of the Corporation lays emphasis on the production of hybrid maize seed which forms an important plank of the Third Plan. The Corporation has entered into contracts with a number of progressive farmers for the production of the foundation seed of hybrid maize. It is proposed to lease out cultivation as well as processing machinery to such growers and producers. In leasing out this equipment, the Corporation will naturally take into account the existing facilities in the various States and the rates being charged by the State Agricultural Departments for the loaning of their equipment." The letter elicited information on the subject from the Director of Agriculture.

In his reply of October 9, 1963, the Director of Agriculture welcomed the selection of Maharashtra State by NSC for the production of hybrid maize. He also suggested that, in addition to the progressive farmers, the government seed multiplication farms could also be selected by the Corporation for production of seeds.

Regarding selection of areas for the production of hybrid seed, NSC advised the Maharashtra Agricultural Department: "Consolidated blocks will have to be selected for seed-production. If this is done, the processing plant can be set up at a convenient central location and the seed from near by produc-

tion fields can be brought to the plant for drying and processing." About the State Director's suggestion regarding selection of government seed multiplication farms, the letter pointed out that the major difficulty will be "one of proper supervision, check, inspection of crop and processing of seed on account of these farms being too far spread out".

At this early stage, it would appear that it required some amount of salesmanship with the state government authorities, before they came to accept the programme and implement it with the necessary enthusiasm.

In the letter of October 21, 1963, to the Director of Agriculture, the General Manager of NSC wrote: "Our research workers in the coordinated maize scheme, in collaboration with the Rockefeller Foundation, have developed the hybrids which are suited to the different regions in the country and within a short period of their release, they have become quite popular among the progressive farmers. Demonstrations carried out in 1963 proved the ability of the hybrids to out yield local varieties by a substantial margin. Thus the hybrid, apart from increasing food production, will give good money returns to the cultivator. A limitation in the rapid extension of area under hybrid maize is the seed supply. The hybrid seed is to be used afresh every year and it must have proper genetic qualities. The production of foundation seed and the certification of the double cross seed has been entrusted to NSC. Subsequently, the activities of the Corporation may include production of high quality foundation seed of hybrid Jowar, vegetables and other crops." The General Manager reinforced his case by drawing attention to the recommendation of the Joint Conference of the State Ministers of Agriculture and Community Development that state governments should give special attention to the programme of cultivating hybrid maize in consultation with NSC.

Meanwhile, the Government of India took certain steps to intensify the programme. The Central Ministry of Food and Agriculture wrote on December 18, 1963 to all the state governments, drawing their attention to the recommendation of the Joint Conference of State Ministers of Agriculture and Community Development. The letter went on to say: "According to the present arrangements, hybrid maize seed

growers and producers obtain their foundation seed from NSC. They also enter into contract with that Corporation in accordance with which the Corporation inspects the crops from sowing to harvesting and processing and the seeds are certified by the Corporation if they meet the minimum standards laid down.

Government of India proposes to make available credit facilities to the seed growers and producers through the state governments. Government of India will sanction to each state government the amount of short term loan to be made available for each season, and, at the same time, NSC will furnish a list of seed growers and producers to whom the loan is to be disbursed. Credit facilities may be provided by Government of India on the basis of Rs. 200 per acre of seed production. The loans from the Government of India to the state governments will carry interest at the rate of 6 per cent per annum and will be repayable in one instalment of principal and interest within 18 months of the date of withdrawal of the loan, provided, however, that if the loan and interest are paid promptly and punctually, on the due date, interest at  $3\frac{1}{2}$  per cent per annum will be charged.

The state governments are accordingly requested to intimate their concurrence to these arrangements."

The Government of India decided that the loan facilities should be provided to the seed growers and producers only through the state governments. The state governments had to decide whether they would disburse the loans through the cooperative societies or through other channels. But, whatever the agency adopted by the state governments, they had to ensure that the loan was paid to the seed producers and growers promptly but only after taking into account the repayment capacity, security, etc., as in the case of other short-term loans disbursed by the state governments. The only difference was that in the amount of loan to be disbursed, the Government of India was prepared to provide Rs. 200 per acre. Further, NSC would intimate the names of seed growers and producers and the acreages to be shown by them, so that the usual process of allotment of loans would be obviated. The Government of India requested the state governments to make these facilities known to the progressive farmers so that

NSC could go ahead enrolling the seed producers and growers for *kharif* 1964.

The Maharashtra Government, however, felt that the production of double hybrid maize seed was a new venture and required technical knowledge for sowing, detasseling, etc. Its cultivation also involved heavy investment to the tune of Rs. 300 per acre, though ultimately, it was a very paying proposition. Taking all these facts into consideration, the agriculture department decided to undertake the production of double hybrid maize seed departmentally until progressive cultivators of the state came to know the technique and were convinced of its being a very paying proposition. No credit facilities were, therefore, required for the Maharashtra State, for the purpose during the year 1964-65.

NSC sent a circular letter on April 1, 1964 to all the Directors of Agriculture: "As a Director of Agriculture, you are in a position to contribute substantially to this programme, which will not only increase food production but also provide raw material for starch and other industries and save the country from imports. Further, the farmers who get hybrid maize seed are assured of genetic purity and high germination and other aspects of good seed. This is because our seeds are produced under strict technical supervision, mechanically dried and processed, cleaned and graded and are finally packed in convenient cloth or polythene bags and sealed. Sealing is an important protection to the farmers as it prevents adulteration. Further, the seeds are tested in government laboratories and the results of the tests are indicated in a tag attached to the seed bag." The letter also asked for estimate of requirements of hybrid maize seed for the *kharif-rabi* 1965 so that the corporation could plan its production programme accordingly. The letter also warned that potential yield in hybrid maize could be realised only if the standard recommended doses of fertilisers were applied and other recommended cultural practices were followed.

NSC, meanwhile, had also prepared an illustrated catalogue of the seeds being developed by them and sent 10 copies of these to the Director of Agriculture, Maharashtra State for distribution to the concerned officers. NSC wanted to know the name and addresses of the field officers, block develop-

ment officers, etc., who were handling the 'grow-more food campaigns' and to whom copies of the catalogue need be sent.

In their forwarding letter, they added, "As you know the Corporation was set up only about a year back and its activities with regard to the development of quality seeds on large commercial basis have not yet expanded to the extent to meet large number of demands for vegetable and other seeds. In an effort, however, to make the slogan of "quality seeds for bigger yields and higher profits" better understood, the Corporation has primarily to muster your support to get the recognition of its activities by the farmers who would be required to be closely associated with this organisation in the long run".

The Indian Council of Agricultural Research in a letter to all the Directors of Agriculture pointed out that under the accelerated hybrid sorghum project, they had brought out a hybrid sorghum seed, CSH-I. The work of the multiplication and sale of this hybrid sorghum seed had been entrusted to NSC. The letter pointed out that this organisation had already published the good points of this programme in the NSC Bulletin. This hybrid seed was suitable for early and medium duration *kharif* season to be sown in July and harvested in October.

A policy letter dated May 19, 1964 from the Government of India to the various state governments explained the guidelines of the Programme during the Third Five Year Plan. "It is contemplated to cover at least 5 per cent of maize area by hybrids by the end of the Third Five Year Plan. For fulfilling these targets and also for ensuring further extension of area, it is necessary that a bold programme of popularising hybrid maize must be taken up. Demonstration in the cultivator's field is an important extension tool in achieving this objective.....Hybrid maize has a potential for very high yields and for obtaining these yields, judicious manuring is necessary. It has, therefore, been decided that the hybrid maize demonstration should be combined with the programme of fertiliser demonstration on maize by utilising the fertilisers provided under the centrally sponsored demonstration and training scheme, and hybrid maize seed will be supplied free

of cost by NSC." The letter asked for immediate action to be taken for selection of cultivators, selection of sites, supply of fertilisers, etc., for implementing the hybrid maize demonstration programme for the year 1964-65.

Meanwhile, a few non-official organisations (e.g., India Crop Improvement and Certified Seed Producers' Association, New Delhi and Maharashtra Hybrid Seeds Corporation, Bombay) attempted to popularise the scheme.

#### WORK DONE IN MAHARASHTRA TILL 1965

The question of rapid expansion of area under hybrid maize, jowar and bajra was discussed with the Member, Planning Commission on May 17-18, 1965 and subsequently with the Secretary, Finance of the Maharashtra Government. For this discussion, notes were prepared by the millet specialist of the Maharashtra State. These notes (see Appendix) provide the necessary background information about the programme and deal with the following points:

1. how hybrid maize, jowar and bajra is evolved;
2. progress made in evolving the varieties by the Rockefeller Foundation, the Government of India and the State Department of Agriculture; and
3. programmes in this behalf followed in America and other States in India.

The steps taken till then by the Maharashtra Government may be briefly summarised. Varieties of hybrid maize had been evolved by the Indian Council of Agricultural Research in close collaboration with the USAID and Rockefeller Foundation. Of these, the Deccan hybrid makka was very suitable for the maize growing areas of the Maharashtra State.

Trials of Deccan hybrid maize were taken in various districts of the State. Demonstration plots were also laid under the supervision of NSC. In the trials, the Deccan hybrid had consistently given higher yields than local maize ranging from 51 per cent to 105 per cent. The results of the trials are given in Table 1.

TABLE 1

<i>No. of demonstrations</i>	<i>Local maize with local practices</i>	<i>With recommended practices</i>			
		Local maize : Deccan : Ranjit			
10	10.4 B. Mds.	20.3 B. Mds.	30.8 B. Mds.	30 B. Mds.	

The production of hybrid maize seed was begun in the state in 1962-63 at the Agricultural School, Manjri, district Poona. The year and the area under hybrid seed production, during the previous 3 years are given in Table 2.

TABLE 2

<i>Deptl. Institution where production of seed was undertaken</i>	<i>Area under seed production</i>	<i>Seed production</i>	<i>Area covered</i>
1962-63 1. Agric. School Manjri, Poona	5 acres	5148 kg.	858 acres
1963-64 1. —do—	5 acres	2073 kg.	1165 acres
2. Tal. Seed Farm Mohol, Sholapur	3 acres	3722 kg.	
3. —do—	3 acres		
	11 acres		
1964-65 1. Agric. School Manjri, Poona	17 acres	8352 kg.	2108 acres
2. Tal. Seed Farm, Mohol	6 acres	1700 kg.	
3. —do—, Sholapur	7 acres	2600 kg.	
	30 acres		

Besides this production of seed on government farms, private cultivators had also taken up production of seed under the supervision of NSC as certified seed growers from 1963-64 and 1964-65.

## PLANS FOR 1965-66

During 1965-66, it was planned to produce hybrid maize:

seed on an area of 90 acres on government farms as given in Table 3.

TABLE 3

	Acres
1. Gram Sevak Training Centre, Manjri, Poona	30
2. Taluka Seed Farm, Ambabad, Poona	20
3. Taluka Seed Farm, Kashti, Ahmednagar	15
4. Trial-cum-demonstration Farm, Kashti, Ahmednagar	15
5. Taluka Seed Farm, Khed, Poona	5
6. Taluka Seed Farm, Charholi, Poona	5
<b>TOTAL</b>	<b>90</b>

In addition, private cultivators were also expected to produce hybrid maize seed in 540 acres during 1965-66.

The production of seed at the estimated yield of one tonne per acre was expected to be 90 tonnes on state government farms and 540 tonnes on the farms of the certified seed growers. This seed at the rate of 6 kg. per acre would be sufficient to cover approximately 1 lakh acres of area under maize in 1966-67.

The state aimed at the establishment of 240 seed farms with an area of 15372 acres by the end of the year. The foundation seed produced from these farms during 1964-65 is given in Table 4.

TABLE 4

<i>Crop</i>	<i>Production in quintals</i>	<i>Yield per acre in quintals</i>
Paddy	5868.32	4.87
Kharif jowar	3085.71	3.78
Bajra	901.50	1.26
Rabi jowar	4403	3.2
Wheat	4544	2.5
Gram	1129	0.88

The production of foundation seed in the state was about 53 per cent of the target; the shortfall was attributed to low per acre yield on seed farms.

The state had as large an area as 18 million acres under the major millets, jowar (*Sorghum vulgare*), bajra (*Pennisetum typhoideum*) and maize. But the yield of these crops from the existing varieties was very low, compared with those of hybrid varieties. The state had under trial a few hybrids of *kharif* jowar developed at Nagpur and of *rabi* jowar developed at Parbhani. But, since they were likely to take a few years before release for general cultivation, it was proposed to conduct trials and simultaneously release the "cooperative hybrids" developed by the Indian Council of Agricultural Research, in collaboration with the Rockefeller Foundation experts under the all India coordinated programme.

In view of the great demand for hybrid seed, the programme for 1965 had to be revised. It was planned to cover 109 acres in government farms and 760 acres in private farms. This was for maize. As for jowar and bajra, the target for the *rabi* season for production of seed on government farms was: jowar: 40 acres; bajra: 16 acres.

In addition to this, hybrid jowar and bajra produced by farmers under the supervision of NSC during 1965-66 was as follows: Hybrid jowar: 45 acres; Hybrid bajra: 7.5 acres.

There was a discussion between the offices of NSC and those of the Maharashtra Agricultural Department on October 16-18, 1965. The state wished to raise the target of acreage under *kharif* jowar from 50,000 in the first year to 2 lakhs in the 5th year and wanted large quantities of hybrid seed and parent seed production for the purpose.

The reaction of NSC was that the plan was welcome but there were restraining factors. The necessary insecticide, Thimet, was in short supply. Moreover, in hybrid seed production, experience was most important, and the state should consult experienced seed producers.

The officers of the state government had not consulted them since they were in touch with NSC. Moreover, in a rapidly expanding programme, new cultivators had to be enlisted and the department was already in touch with progressive farmers in the state. At the same time, the State Farming Corporation was only chosen as being the largest single organisation capable of tackling this new programme. The state government stated that, in their Agricultural Department, they had

highly trained plant breeders for guiding and advising all concerned.

NSC was in favour of seed being produced by private cultivators, since the government agency would bring down the price of the seed and kill the incentive of the private seed producers. The department's representative pointed out that the State Farming Corporation was itself a commercial organisation and would look after its own interest. As for the department, it wanted a fair price both for the seed producer and the consumer.

Regarding installation of machinery for processing seed, it was pointed out that hybrid seed producers should be in a compact block so that the seed from different producers can be processed in a central place. This point should be borne in mind in selecting prospective seed producers. A unit of 500 acres within a radius of about 5 miles was considered suitable for a medium size machine.

Regarding other points, the state government officials stated: "Whereas in the long run, the bulk of the hybrid seed of jowar, bajra and maize would be produced by private agencies, approved by NSC on the advice of the State Department of Agriculture, a small quantity of the hybrids would also be produced annually by the State Department of Agriculture on government farms, registered with NSC. This would serve to train the private seed producers as well as the state supervisory staff and would also to some extent supplement the production of hybrid seed by private agencies till adequate seed would be produced by the latter."

The anxiety of NSC to build up a seed industry on the basis of private enterprise was necessarily based on the assumption that the prices of the hybrid seed would be such as to provide the necessary incentive to the private seed growers. This was indicated in the letter of Shri Y. R. Mehta, General Manager of the Corporation to Dr. Ghatge, Director of Agriculture. "The resources of the government, both central and state, are limited and because of the stringency of funds, many plan programmes are being cut. This makes it necessary to allow profits in seed production and distribution so as to attract good people into seed production and distribution business. We should avoid depressing the prices

to unprofitable levels.

In the production of hybrid maize seed, besides the additional costs due to foundation seed, transport, roguing, detasseling, etc., there are the costs of processing which includes sorting, drying which is done mechanically, cleaning, grading, treating with insecticide and sealing of the bags. Further close supervision is necessary at all stages to ensure quality of seeds. This necessarily involves employment of qualified personnel.

The programme for summer 1966 was perhaps influenced by the discussions of the state authorities with Shri B. Sivaraman, Secretary, Department of Agriculture, Government of India. Copies of the notes recorded by him were sent by the private secretary to the chief minister in a note dated December 30, 1965, to the Minister for Agriculture, and Secretary, Agriculture and Community Development. The extracts of the note are as follows:

We had originally targeted for jowar foundation seed production on 2200 acres for the whole of India. This area has more or less been allotted and Maharashtra has been given 501 acres for seed production. The various states were consulted about their demand of hybrid sorghum seeds for 1966-67 *kharif* season and the demand so far received is only 4.81 lakh acres, out of which Maharashtra will be growing 2.17 lakh acres. As the demand is more than the seed that may be produced in 2200 acres, we have arranged with the Rockefeller Foundation to rush the female lines MSCK-60-A and 6 tons have already been shipped and will reach India in the middle of January and another 8 tons are being booked shortly and will reach India in February. This seed will be enough for a further 4666 acres. If Maharashtra is willing to organise and grow the seed, we can allocate seeds for 4000 acres without any difficulty. It is suggested that a firm demand may be placed by Maharashtra on NSC and action taken to organise the production. There was some nicking trouble in Maharashtra last year. Therefore, experts have to be

especially careful in closely supervising the production and taking corrective steps at the right time to ensure proper nicking. In our calculations, we have assumed an average seed production of 350-400 kgs. per acre. By good husbandry it should be possible to reach 600-700 kgs. per acre. It is suggested that Maharashtra who are keen on this programme may take special steps to organise good seed production.

#### FILLIP GIVEN BY THE CHIEF MINISTER

The question of hybridisation and multiplication of seed was discussed at the 28th meeting of the High Level Agricultural Production Committee held on November 5, 1965. It was at that meeting that the Chief Minister made his famous pronouncement that "the Government of Maharashtra had firmly resolved to tackle the critical food situation as a battle for survival and make the state self-sufficient in respect of foodgrains within the next two years."... "In order to achieve this goal, it is necessary to initiate and execute a series of measures, the most important of which is to cover the cultivable area by high-yielding hybrid seeds. According to the Government of India's plan, an area of 40 lakh acres each is to be brought under hybrid crop of jowar, bajra and maize in the country. Considering the area under these crops in our state, the share of Maharashtra works out to 15 lakh acres of jowar, 5 lakh acres of bajra and 2 lakh acres of maize." The Chief Minister directed that "in view of the pressing necessity to achieve self-sufficiency in foodgrains, this target should be doubled and achieved within three years." He also directed that "a Committee consisting of the Chief Secretary, the Secretary, Finance Department and the Secretary, Agriculture and Cooperation Department, should be constituted to go into this problem thoroughly and draw up a phased plan for putting through a crash programme for hybridisation and multiplication of seeds." The Chief Minister further directed that the overall responsibility for the hybrid programme would rest on Dr. Vaidya, Additional Director of Agriculture. He should be in constant touch with the Secretary, Agriculture and Cooperation Department and Minister for Agriculture to whom he should

report at once any particular difficulties or bottlenecks in the quick execution of this programme.

The Chief Minister, during the discussions at the High Level Committee meeting had indicated broadly the programme for summer 1966. According to him, Maharashtra was likely to get additional 12 tons of hybrid jowar seeds of both male and female parents from NSC for seed multiplication in January 1966. Out of this quantity, 6 tons were already available with NSC and it would get 6 tons more from US. Maharashtra should, therefore, be prepared to accept the seeds which would be sufficient for sowing 3,000 acres for multiplication programme in January 1966. The produce of this would be available for sowing in June 1966 over an area of approximately 3 lakh acres. One thousand acres out of this were to be located on the lands of the State Farming Corporation, Maharashtra State, at some of their units, viz., Walchandnagar, Sakharwadi, Changdeowadi and Tilaknagar, whereas another 1,000 to 2,000 acres would be available as indicated by the Secretary, Agriculture and Cooperation Department in the Ganganagar Sugar Factory area, irrigated by the Godawari canal or river.

At this High-Level Committee meeting, some members expressed concern as to whether all the area sown with seed was being looked after properly. A decision was, therefore, taken that fullest possible help of technical officers would be taken so that seed multiplication programme would not suffer on account of lack of technical supervision and guidance. Shri K. R. Gupta, Technical Officer (II) was accordingly instructed to inspect the State Farming Corporation area once in 10 days. Professors and Lecturers in Botany of Agricultural Colleges were also asked to inspect farms near their headquarters.

One of the important questions to be settled was about the areas on which the foundation seed was to be produced. In his letter of November 16, 1965, Dr. K. G. Joshi, Joint Director of Agriculture (Extension) wrote to Dr. Y.R. Mehta, General Manager of NSC: "In our opinion, the programme of production of foundation seed should be as far as possible on government research farms and the farms of corporations like the State Farming Corporation of Maharashtra on which

the staff of NSC and that of the state government would have full control." This was particularly pressed because a certain percentage of admixture of A and B parents was observed that year on the farms of the registered growers and governmental institutions.

NSC informed the Director of Agriculture on November 25, 1965 that they were deputing Shri D.S. Rana, one of their ablest officers, who had recently returned after training in the US to Maharashtra for arranging hybrid seed production on about 5,000 acres, provided suitable farmers with irrigated well-drained land were available in convenient blocks." The Director in his reply stated that arrangements were being made to find suitable growers for covering that area. The allocation of 5,000 acres was as follows: 1,000 acres of Ganga 101 maize; 500 acres of maize Ranjit; 2,000 acres of CSH 1 jowar and 1500 acres of HB 1 bajra.

The Director instructed Shri K.R. Gupta, Technical Officer (II) to contact the *Parishad* Agricultural Development Officers, Sangli, Satara, Kolhapur in the first instance and later on other *Parishad* Agricultural Development Officers and to arrange as much area as possible for the seed production programme. In his tour note dated November 30, 1965, Shri Gupta pointed out that the area would have to be compact and spread over a few villagers. He, therefore, proposed the idea of establishing the seed villages, wherein all the available irrigable area in the village would be put under one crop.

At the State Farming Corporation meeting held on November 27, 1965, the Chief Minister enquired about the progress of work in connection with the multiplication of hybrids of jowar, bajra and maize and the area which the State Farming Corporation was making available for the same. He was informed that the State Farming Corporation would make at least 3,000 acres available by January 1966, and that the remaining 2,000 acres would be secured from the cooperative sugar factories, private growers and some of the seed and research stations where water facilities were available. The Chief Minister appreciated the idea and emphasised that full advantage should be taken of the cooperative sugar factories in the programme. He further added that they should imme-

diately place a demand for the seed of parents to cover an area of 10,000 acres instead of 5,000 acres of all types of hybrids and arrangements should be made to cultivate the parents so that, during the next summer season beginning in January 1966, they would be available for distribution to cultivators. When he was informed that they were already getting maize seed to cover an area of 15,000 acres, he observed that they should try to cover an area of 50,000 acres and have an adequate quantity of parent seed of jowar, bajra and maize to cover an area of 10,000 acres.

The enthusiasm of the Maharashtra Government about this scheme is revealed in a letter dated December 1, 1965 from Dr. K. G. Joshi, Joint Director of Agriculture (Extension) to the Superintending Agricultural Officer, Aurangabad Division, Aurangabad: "The Government of India would be supplying foundation seed of parents of jowar, bajra and maize by about June 15 for the production of hybrid seed of these crops during the coming summer season. The plantation will have to be completed by January 15-25, 1966 and harvesting of all the three crops would be in the middle of May and hybrid seed made available for planting during the ensuing *kharif* season."

NSC organised a training class at New Delhi from December 13, 1965 for a period of two months, with a view to train agricultural technicians to handle production and processing of hybrid seeds of jowar, maize and bajra.

In appreciation of the role played by the Maharashtra Government in implementing the scheme, NSC wrote on December 3, 1965 to the Secretary, Food and Agriculture Department of Maharashtra: "We are happy to note that the Director of Agriculture is arranging the production of hybrid seeds of jowar, bajra and maize on 5,500 acres in the coming summer season. We are arranging the supply of foundation seed for covering the above area—2,000 acres of hybrid jowar, 2,000 acres of hybrid maize and 1,500 acres of hybrid bajra. In doing so, we are diverting the bulk of available foundation seed to Maharashtra State. We believe Maharashtra has great potential in respect of all the three hybrids. However, to meet our obligations in respect of other states, we have to procure back from you the following seed produce: A third

of the production of hybrid jowar; half of the production of hybrid bajra; and three-fourths of the production of hybrid maize."

In addition, some private seed producers would also produce hybrid seed in Maharashtra under our supervision. The areas of seed production are being finalised in consultation with the Director of Agriculture and Maharashtra Farming Corporation. Once these are finalised, our engineering staff will recommend plans for setting up seed processing plants for proper drying, cleaning, grading and bagging of seeds. We will also be locating our trained agricultural staff to guide the seed production and to inspect and exercise internationally accepted quality control measures". The Bulletin of NSC indicated cultural practices to be adopted for high-yields of hybrid maize and hybrid sorghum. These indicated the seed rate, fertiliser doses, control over pests, land preparation intercultivation drainage and irrigation. The seed rate indicated for hybrid maize was 6 kilos of seed per acre, in case of bajra  $1\frac{1}{2}$  to 2 kgs. per acre for direct planting and 1 to  $1\frac{1}{2}$  kgs. per acre through nursery and for jowar, 5 kgs. per acre.

#### IMPLEMENTATION

The programme for the production of certified hybrid seed of maize, jowar and bajra in the various districts during summer 1966 (January 1966 to May 1966) was chalked out in a letter written by the Joint Director of Agriculture to all the Chief Executive Officers of the *Zilla Parishads*. He emphasised the need for securing the areas before December 31, 1965 so that the crops can be sown up to middle of January 1966 and harvested by the end of May 1966 and seed processed and distributed in May, 1966 for sowing in *kharif* season of 1966-67. The plan was to have at least 10 lakh acres during the year 1966-67 and about 60 lakh acres during 1967-68. It was, therefore, necessary to produce hybrid seed for an acreage of about 10 lakh acres before the *kharif* season of 1966 which would commence in the first week of June 1966. Ten private growers registered with NSC were expected to produce hybrid seed for 4.5 lakh acres before the *kharif* season of 1966. An additional area of 5,500 acres would have to be covered in the summer of 1966 to produce

hybrid seed required for the remaining 5.5 lakh acres and the programme for this area was as follows:

Maize (Deccan, Ranjit and Ganga-101)	2,000 acres
Jowar (CSH-1 and CSH-2)	2,000 acres
Bajra (BH-1)	1,500 acres
	<hr/>
	5,500 acres
	<hr/>

NSC had agreed to give the necessary foundation seed of parents.

The organisation of work indicated for summer 1965-66 was as follows: The Chief Executive Officers and *Parishad* Agricultural Development Officers of the districts would be the main organisers of the programme. They were to organise a meeting of various officers concerned and assign the responsibility to the campaign officers of the district or any other Class II officer in consultation with the Superintending Agricultural Officer. The sugar factories will share the responsibility with the *Parishad* Agricultural Development Officers. Technical guidance to the districts would be provided by Professors of Agricultural Botany of the Agricultural College, Poona. The Chief Executive Officers would send their campaign officers or the District Agricultural Officer or any other suitable Class II Officer for a three days training programme organised at the Gramsevak Training Centre, Manjri, District Poona, from December 26-28, 1965. The district officers on return from training should train the team of Agricultural Officers, Agricultural Extension Officers and Agricultural Assistants in the district who would supervise the district programme. Their training would be completed by January 5, 1966. The district team should prepare a detailed list of cultivators of each village, showing the acreage under the various crops. Isolation of the areas producing these seeds, as insisted on by NSC was an important factor to be borne in mind. As far as possible, the programme should not extend beyond two or three villages in each district and all the areas under production should be as compact and contiguous as possible. Necessary cooperation of local

irrigation officers must be obtained to provide water for the required acreage. The crops must be fertilised at the doses given earlier and the *Parishad* Agricultural Development Officers should ensure that these fertilizers reach the cultivators well in time. Finance had to be provided by the central cooperative banks of the district in addition to loans given by the Agriculture Department. The processing of the certified seed would be done in the processing units which were being installed at various districts.

The Secretary of the Maharashtra Agricultural Department was anxious to know the progress of the scheme from Dr. Vaidya. He desired that the entire machinery of men and equipment should be geared to this task to the maximum possible extent and hoped that the organisation for this programme had already been mobilised. Dr. Vaidya in his reply said that detailed plans for producing the hybrid seed of maize, jowar and bajra on an area of about 9,000 acres during the *rabi* and ensuring summer season had been worked out, and assured that maximum efforts were being made to produce hybrid seed on an acreage during the then current *rabi* and the ensuing summer season as to have adequate commercial seed to cover an area of 10 lakh acres in the *kharif* and *rabi* seasons of 1966-67.

Detailed technical instructions were conveyed by Dr. Joshi to the Chief Executive Officers in his letter of December 23, 1965 on the production programme of hybrid seed for all the three crops.

A meeting of the private producers of certified seed was held in the chamber of the Secretary, Agriculture and Co-operation Department, on December 7, 1965 when Dr. Vaidya and Dr. Joshi were also present. The private seed growers expressed difficulties regarding supply of fertilizers and import of machinery, particularly rotary hoes, etc.

Dr. Vaidya in a letter pointed out that he had some difficulties with the Irrigation and Power Department and suggested that this should be taken up at the Secretariat level and the Irrigation and Power Department should be asked to give top priority to this programme.

As suggested by Dr. Vaidya, coordinating action with the

Irrigation Department for the supply of water was taken at the Secretariat level. A note recorded by Dr. Shaikh, Secretary, Agriculture and Cooperation Department on December 21, 1965 said, "The Chief Minister was pleased to take a meeting this afternoon with the Secretary, Agriculture and Cooperation Department, Secretary, Irrigation and Power Department, Chief Engineer and Chief Engineer (Minor Irrigation), and directed that the following points should be paid special attention to by the Irrigation and Power Department.

"For hybrid parents seed stock production, the Department of Agriculture requires in all about 10,000 acres to be covered at various places including Poona, Manar, Koyana, Bhatnagar and other irrigation works and canals. The requirements of hybrid parent seed cultivation in the summer season should be given special attention and all efforts should be made to locate water resources and indicate them so that the Department of Agriculture, if necessary, will shift the areas of cultivation to such locations."

In a letter dated December 16, 1965, to the Additional Director of Agriculture, Dr. Shaikh pointed out: "If it is not feasible to get irrigation water in a district, the programme will be diverted where irrigation water is available. No seed should be wasted for want of proper coordination of irrigation water with the hybrid seed issued".

According to a circular letter dated December 31, 1965, the tentative break-up of the acreage given under the programme for the production of hybrid seeds of maize, jowar, and bajra was as given in Table 5.

In January 1966, the Joint Director of Agriculture (Extension) wrote to the Chief Executive Officers that the despatch of foundation seed had already begun and that the seed for remaining acreages would be received within a few days. He emphasised that the seed should be lifted immediately and delivery taken and arrangements made for sowing in the presence of the supervising officers of NSC.

At a meeting held in the chamber of secretary to government, which was attended by the Director of Agriculture and some progressive farmers on January 18, 1966, the progress in the production of certified seed was reviewed. The area

TABLE 5

<i>District</i>	<i>Jowar</i>	<i>Maize</i>	<i>Bajra</i>	<i>Total</i>
Sangli	800	850	250	1900
Satara	325	350	150	825
Kolhapur	250	200	—	450
Maharashtra State Farming Corporation (Toka unit)	250	250	250	750
Nasik	100	115	300	515
Nanded	200	175	—	375
Parbhani	200	175	—	375
Buldhana	65	60	25	150
Akola	60	75	25	160
	2250	2250	1000	5500

under hybrid seed production during *rabi* season 1965-66 and summer season of 1966 would be 3066 acres under maize, 3177 acres under jowar and 1055 acres under bajra. Taking average multiplication ratio as 1 to 100, the hybrid seed produced from this acreage will be sufficient to cover the following areas during the *kharif* season of 1966-67:

Hybrid maize	:	3,06,600 acres
Hybrid jowar	:	3,17,700 acres
Hybrid bajra	:	1,05,500 acres

#### DIFFICULTIES IN IMPLEMENTATION

Various difficulties were encountered in the implementation of the programme. These difficulties were reflected in several communications between the various officers of the Maharashtra Government, NSC and the Central Government.

A letter from Dr. Vaidya, Joint Director of Agriculture, to Dr. Shaikh of January 23, 1966 mentioned that, by the end of January, hybrid maize seed sufficient for 1950 acres as against the demand of 2,500 acres and hybrid bajra seed for 1,000 acres had been received and distributed. Six tons of foundation seed of jowar from USA were expected to land on January 24, 1966. In his letter of January 14, to Dr. Vaidya, Dr. Shaikh pointed out that though the hybrid jowar

patent seed for 4000 acres promised by NSC was expected to reach on the 24th and could be arranged to be despatched on the 25th itself, it was for consideration whether this would not be too late to sow the parent seed as the flowering would be towards the end of March when the temperature was likely to be 104-105° in the Deccan trap and in certain regions like Kolhapur rains were likely to set in and this might adversely affect the programme.

The Additional Director informed Dr. Shaikh on trunk telephone that the opinion of the technical experts was that hybrid seed for seed multiplication should not be sown after February 7, and as such all seed that could not be sown before that date or whatever seed would be received by about that date would have to be kept for sowing in the *kharif* season, i.e., June or July for further multiplication. This seed should be stored in cold storage with a de-humidifier.

The question of the timeliness of sowing became a matter of considerable discussion. In his letter of January 25, 1966 to the Chief Executive Officer, *Zilla Parishad*, Sangli, Shri A. C. Saxena, Officer in Charge, Seed Certification Centre, Poona, said: "In my opinion, it is too late for taking up the plantings. The late planted crop will come to flowering stage sometime in the second week of April when the temperature is expected to be about 109-110 degrees. This high temperature will not permit proper pollination in these crops. In order to get a successful crop, we should avoid this high temperature and plant the crops as early as possible."

Shri V. B. Malik of NSC pointed out that he had learnt that the deadline for sowing which had been fixed for February 28 was being further postponed. He pointed out the risk in such late sowings. If planting was as late as second or even first week of March, these crops would experience high temperature and dry weather during their flowering stage. Moreover, the crops would also be caught up by the rains on maturity and this would definitely affect the quality of the seed adversely. He, therefore, suggested that they should adhere strictly to the deadline originally fixed, viz., February 28. Dr. Vaidya in his reply pointed out that the deadline of February 28 was fixed only for Sangli district and it was because the summer crop would be harvested by

second week of June, at least a fortnight before the rains; moreover, Shri Vasantrao Patil, the man behind this big seed multiplication programme in Sangli district had promised proper arrangements for storage of the produce in proper sheds. He had gone into the case of Sangli very carefully and had extended the date up to February 28 after due consideration of all factors and hoped that NSC would agree with him in extending the date. The *Parishad* Agricultural Development Officers were requested that no sowing should be done after February 28.

There were also some serious difficulties experienced as a result of pest attacks. The *Parishad* Agricultural Development Officer, *Zilla Parishad*, Kolhapur, for example, pointed out some difficulties in the implementation of the hybrid seed programme and asked for modification of targets. In his letter dated January 19 to the Technical Officer, he pointed out, "In *kharif* season, the results of hybrid jowar are quite promising but the experience in *rabi* season is discouraging due to heavy attack of stem fly and flea beetle. I am sure that in the summer season also there will be heavy attack of shoot fly and other insects. The control measures suggested by the department do not give 100 per cent effect. Due to this, the cultivators in this district are reluctant to take the jowar crop in hybrid seed production programme."

That these difficulties were not imaginary was in fact borne out by a rather frantic letter from the Deputy Seed Production Officer of NSC to Dr. Vaidya. It stated, "During the last two days, I visited some of the certified sorghum seed production crops at Walchandnagar and Sakharwadi. I noticed that there is a serious attack of shoot fly in about 50 per cent of the planted area, despite the fact that they have applied Thimet and are constantly using the spraying of Endrex 20 E.O. The attack of shoot fly is still persistent. You have a very ambitious sorghum seed production programme in about 4,000 acres which is yet to be planted. I am anxious that this programme should not meet with a similar fate. Since we are already in a very advanced state for taking up the sorghum seed production programme, we have to be perfectly forearmed to meet this shoot fly menace. Your Entomologist and the Plant Protection Department

may kindly be apprised of this danger and they should be made available at each planting location so that necessary steps should be taken very well before infestation of shoot fly. Besides, your technical experts may please also keep a very close vigil on the seed production plot". On this letter, Dr. Vaidya observed as follows: "This is rather disappointing. Director of Agriculture may like to see and a copy may also be sent to Agricultural Entomologist and Plant Pathologist and Chief Plant Protection Officer intimating the places where foundation seed is given for hybrid seed multiplication and requesting them to visit the area. Also we must make sure that sufficient pesticides are kept at each place". Copies of the letter from the Deputy Seed Production Officer were sent accordingly to the Chief Plant Protection Officer, the Plant Pathologist and Agricultural Entomologist and they were requested to contact the *Parishad* Agricultural Development Officers, visit the areas and advise the Plant Protection Officers in the district to take all possible measures to prevent the attack of shoot fly and other diseases.

The Agricultural Entomologist in his letter of February 22, to all the *Parishad* Agricultural Development Officers observed that the jowar crop was highly susceptible to the attack of various noxious pests like stem fly, flea beetles, stem borers, hoppers and aphids. It was, therefore, necessary to keep the crop free from attack of these pests by regular spray or dusting operations. He also requested them to communicate the exact sowing dates of hybrid crops so that the Plant Protection Officer could visit and give the necessary guidance.

Another difficulty in implementation of the programme was the need for adequate staff. The Secretary informed the Additional Director on January 28, 1966 that he had sent a telegram to the Director of Agriculture for appointment of 4 gazetted officers, eight agricultural officers, 16 agricultural assistants, 10 peons and adequate clerical staff immediately for the hybrid seed multiplication programme. Ten thousands tons of fertilizer had been made available by the Regional Director of Food and had to be lifted.

Another important question was the adequacy of the staff of NSC. In his letter of January 25, 1966, the General Manager of NSC said: "In fact at present almost our entire

staff is now in Maharashtra and Mysore, leaving a small skeleton staff at the headquarters. I can assure you we have deputed as much staff as we possibly can in Maharashtra”.

As regards the use of the college staff for supervision work, some difficulties were experienced. For instance, the Principal of the College of Agriculture, Dhulia, wrote to Dr. Vaidya that in view of the importance of teaching work in those near-examination days, it might not be possible for the Assistant Professor of Botany at this college to camp at Nasik for prolonged periods of 15 to 20 days at a stretch.

Another question which constantly cropped up was the supply of seed to the private seed growers who had established direct contact with NSC. In his letter of January 28, 1966 to the Director of Agriculture, General Manager of NSC said, “We are giving all the six tons to you to be planted in Maharashtra. Some of our old producers had sent their demands to us long back for jowar foundation seed. But due to non-availability, we could not supply them and we had committed ourselves to supply them from the imported stock. We request you, therefore, to be kind enough to supply the seed to our old producers”. The supply was made to them according to the letter of the Department of February 1966.

On January 19, 1966, the Irrigation and Power Department of Maharashtra issued orders for water supply on nira canals during the hot weather of 1966 for 1000 acres of hybrid seeds including the estates of the Maharashtra State Farming Corporation on their sugar farms and to the progressive farmers. This supply was ordered on the assumption that the Maharashtra State Farming Corporation would not demand any post-seasonal watering for their standing *rabi* crops. If any water was required and consumed as post-seasonal, it would mean proportionate reduction in the hot weather sanctions of water for hybrid seed.

It is not clear whether regular progress reports were obtained from all the Superintending Agricultural Officers. A report of February 4, 1966 is, however, available in the records from the Aurangabad division only.

Some of the difficulties in the implementation of the programme under the Jamgaon Lift Irrigation Project were indicated

in the letter from the Superintending Agricultural Officer, Aurangabad to the Additional Director of Agriculture. In his letter of February 9, 1966, he says:

1. Management of irrigation was not proper: the irrigation department should appoint canal inspectors or *patwaris* for this purpose.
2. Irrigation water could not be fully utilised due to defective lay-out of field channels.
3. Night irrigation could not be properly taken because the channels often breach as they are new and not yet properly set up.
4. Cultivators do not irrigate at night time.
5. Cooperation from cultivators is not being received as expected.

As regards the supply of fertilisers, the office of the Director of Agriculture requested the Chief Plant Protection Officer and Compost Development Officer to take immediate action to place the required quantities at the disposal of the *Parishad* Agricultural Development Officers to enable them to further supply it to cultivators participating in the seed production programme.

Another request was to post a Seed Production Assistant to supervise the sowing of hybrid seed crops. On February 14, 1966, the office of the Director of Agriculture wrote to the Deputy Seed Production Officer, NSC to post these assistants immediately in the districts.

Dr. Mehta and Shri Veeraraghavan of NSC visited the various seed farms in the state and discussed their observations with Dr. Shaikh. Their remarks were communicated by Dr. Shaikh to Dr. Vaidya on February 8, 1966. Some of the points mentioned in the letter are:

The pest control and seed control work will have to be done continuously by insecticide squads. Sufficient men and pesticides should be at their disposal throughout, so that the parent seed does not get ruined due to negligence. The female and male lines will have to be watched and fostered for equal and timely growth by adjusting water,

fertilisers, etc., from time to time so that the flowering time will be watched to produce seed. The senior agronomist and the officers of the department knowing hybrid cultivation should keep on visiting the farms constantly and give instructions to the field staff to watch and foster the growth so that proper seed production is achieved without any nicking.

About 40 seed processing machines will be required. We will have to earmark godown capacity for storing the hybrid seed in proper conditions so that there is neither excessive heat nor humidity and no wastages. These will have to be located all over the state so that we do not have to carry the produce over long distances.

Government have approved the appointment of a State Hybrid Specialist and Dr. Sawant has been asked to join immediately. He would assist you in chalking out and supervising the entire programme.

The letter ended with the following:

I hope the Superintending Agricultural Officers and the *Parishad* Agricultural Development Officers are fully in touch with the total programme that we are working out, as otherwise the programme may not be given proper precautions in all the districts and to that extent, its efficiency may suffer.

A copy of the letter was endorsed therefore to these officers for their information.

A constant problem in the implementation was deviation from the technical standards of crop planting. In his letter of February 23, 1966 to the Additional Director of Agriculture, the Senior Agricultural Inspector of NSC pointed out, "The progress of planting is extremely slow. The *Zilla Parishad* Officers are following their own means and methods in planting and no care is being taken to avoid mixing of male and female seeds. They are not at all following the technical advice of our staff posted to help the *Parishad* people in technical matters. Since this is a new sort of enterprise for those people, it is necessary that they follow our guidance in

planting and other operations so that they may not come across any undesirable consequences afterwards." Dr. Vaidya immediately wrote to the *Parishad* Agricultural Development Officer, *Zilla Parishad*, Poona, and requested him to see that planting of female and male plants were done according to the approved plan.

#### REVIEW AND FURTHER STEPS TAKEN FOR IMPLEMENTATION

The programme was reviewed at a meeting under the chairmanship of Dr. Shaikh on February 25, 1966. It was found that the maximum areas that would be covered both in private as well as state sectors by February 28 would be:

jowar	2,598 acres
maize	2,340 acres
bajra	643 acres
Total	<hr/> 5,581 acres <hr/>

At this meeting, the question of production of foundation seed during 1966-67 season for coverage under seed crops during 1967-68 season to meet the hybrid seed requirements during 1968-69 was also discussed.

The Secretary was to discuss the programme with a Team of Experts from the Government of India and NSC. For this purpose, the Additional Director with the assistance of Dr. Sawant was asked to prepare a note on the programme. The note mentioned the acreage covered up to Feb. 28, 1966.

According to the note, eight seed processing plants were being erected each at a cost of about Rs. 1 lakh in building and machinery. The plants were to be completed before September. Necessary staff consisting of one Foreman Supervisor, one Mechanic, one Attendant and one Storekeeper was to be posted at each plant.

Six officers were trained at the seed processing and production course organised by NSC between December 15, 1965 and February 14, 1966. Forty to fifty officers would be trained by them. Each district would have a nucleus of two

trained officers. These officers in turn could arrange training at district level for subordinate staff.

To implement the programme of production of hybrid seed successfully and efficiently, the note suggested that it would be necessary to provide technical staff at the state and district level on the following pattern:

TABLE 6

<i>State</i>	<i>District</i>
One Hybrid Seed Production Officer (Class I)	One Class II Officer for every 1000 acres
Two Hybrid Seed Production Officers (Class II)	One Agricultural Officer for every 500 acres
Two Technical Assistants in Grade I	One Agricultural Assistant for every 100 acres
Ministerial staff	Ministerial staff

As a policy measure, the note also suggested that in order to streamline production, it would be desirable that all hybrid seed production was done under the supervision of the state locally, rather than through private seed growers affiliated to NSC, over whom the state government had no control either in regard to the processing policy or distribution programme.

As regards the programme for 1966-67, the note suggested that in order to cover 65 lakh acres under hybrid seeds during 1967-68, it would be necessary to put 65,000 acres under hybrid seed production in the year 1966-67. This would consist of 40,000 acres under sorghum, 17,000 acres under maize, 8,000 acres under bajra. Half of this would be in *kharif* 1966-67 season and of the remaining 50 per cent, about 35 per cent in *rabi* season and 15 per cent in summer season. NSC, the note pointed out, would have to make arrangements for supply of foundation seed for the acreage mentioned above.

A circular letter of March 1966 issued on behalf of the Director of Agriculture to all the *Zilla Parishad* Officers, Superintending Agricultural Officers, Divisional Soil Conservation Officers and other departmental officers gave instructions about the after-care of the seed sown. The circular

said: "The sowing of the hybrid seed production fields has been completed by February 28, 1966. Though sowing has been delayed in some cases 'operation planting' has on the whole been completed quite satisfactorily. However, the 'operation after care' of the sown crops is not only as important but more crucial than the planting itself. It would, therefore, be essential to take all possible after-care of the crop to bring it to successful maturity. The staff entrusted with this work should, therefore, pay very frequent and regular visits to the seed production plots and see that the flowering operations are done regularly and in time. The staff should be on constant move to implement the operations:

1. *Plant protection measures:* In the case of lower crop, the staff should watch out for the attack of the beetle, stem borer and shoot flea. Endrin spraying, as per given schedule, should be given to control these pests. In the case of the attack of Army worms in maize, the dusting of the crop with 10 per cent BHC dust should be given to control and eradicate the pest.
2. *Fertilisers:* The second dose of fertilisers consisting of 20-25 kg. of  $N_2$  would be due to be applied to these crops when they are 30 to 35 days old. This dose may be applied in between the rows of the plants in time so that the crop continues to make good growth. Fertilizer should be properly mixed with the soil and irrigation should be given immediately afterwards.
3. It would be necessary to see that the crops are irrigated regularly at an interval of 10 days so that the growth does not suffer for want of moisture in the soil. Wherever necessary, the district officer of the Irrigation and Power Department should be approached to give timely water for irrigating the crops. In case of any difficulties, the department should be approached with definite proposals. The period following soon after the heading would be critical from the point of view of pollination and subsequent fertilisation. Frequent light irrigation would keep the temperature down and will create the necessary humid condition in the earhead zone of the crop and would

help proper pollination and fertilisation.

4. It would be necessary to keep a close watch on the relative growth of both the parents. It has been observed that the male parent in case of jowar crop is late in heading. If the growth of male parent is lagging behind, then a dose of 10 lb. of  $N_2$  per acre in the form of urea followed by irrigation of male only should be given when the crop is about 40 days old. This will accelerate the growth of male parent rows and keep in proper nicking of the parents.
5. In the case of maize crop, the first tassel would be seen when the crop is about 40-45 days old. Detasseling of seed parent rows should be done very scrupulously as per instructions. Detasseling has to be done every day in every field till the last tassel from seed parent rows is removed. It should be noted that NSC insists on a very high standard of detasseling. More than 10 per cent shedding tassel in any one inspection and more than 2 per cent shedding tassel in all the inspections may lead to the rejection of the crop and hence very careful attention should be given to this aspect of the crop. Each and every field would have to be visited to see that proper detasseling has been carried out. Holidays and Sundays should not be allowed to interfere with detasseling work.
6. In the case of jowar and bajra, roguing of all types should be done before flowering, from both male and female parent rows. At flowering, roguing should be done to remove pollen shedding types in seed rows. The help of the staff of NSC appointed in each district should be taken in all such operations.

#### MASTER PLAN FOR 1966-67

The Master Plan for hybrid seed production for the year 1966-67 was issued by the Director of Agriculture to all the Chief Executive Officers of *Zilla Parishads* in his letter dated February 19, 1966. The following are some of the excerpts from that letter.

In order to step up food production, Agriculture

Department concentrated its attention on cultivation of hybrid maize in the summer campaign of 1965-66. With the encouraging response obtained from cultivators as well as performance of hybrid jowar, bajra and maize in the demonstration plots, it has been decided to expand this programme substantially during 1966-67. A programme of hybrid seed production has already been undertaken during the summer of 1965-66. This will provide sufficient commercial hybrid seed to cover about 15 lakhs acres—6 lakh acres under maize, 8 lakh acres under jowar and 1 lakh acres under bajra, during 1966-67.

The programme for 1967-68 is 50 lakh acres—12 lakh acres maize, 30 lakh acres jowar and 8 lakh acres bajra and for this, it would be necessary to put 50,000 acres under production of hybrid seed during 1966-67. This area will have to be divided into 20 districts which exclude Konkan districts of Thana, Kolaba and Ratnagiri as also Chanda and Bhandara which are mainly rice-growing tracts. Any small requirements of hybrid seeds in these districts can be met from the neighbouring districts. Each district will therefore have to undertake hybrid seed production programme of about 2,500 acres. Since two crops of hybrid jowar, bajra and maize can be raised in a year on the same land, it would be necessary to have at least 1,250 acres under irrigation in each district for production of hybrid seed. This area should come from 3 to 4 villages, as far as possible in a compact block; so that proper isolation can be ensured and processing plants set up to process the seed. From the experience obtained during 1965-66 season, it is observed that a number of progressive cultivators owning land either under lift irrigation or canal irrigation, the *Sahakari Sakhar Karkhanas* as well as cooperative lift irrigation societies are keen to register themselves as hybrid seed producers. You are, therefore, requested to prepare a list of such progressive cultivators or cooperative societies and see what compact size blocks they are willing to assign for hybrid seed production and further ascertain whether:

1. they are willing to register themselves as hybrid seed producers with NSC;

2. they agree to work under the general supervision of the Agriculture Department and NSC.
3. they agree to receive guidance and permit inspection by the technical officers of the Agriculture Department as well as NSC; and
4. they agree to get their produce processed at the processing units set up by the Agriculture Department and sell the same to cultivators as seed at the rates approved by the Agriculture Department and NSC.

If these lists are sent to this department by the end of March 1966, it would be possible to scan through the same, undertake spot inspection and finally approve the registered producers and complete other formalities by way of registration with NSC filling in the agreement forms, etc.

It may be mentioned here that hybrid seed production is not only a technical job but also a costly one, involving high expenditure on seed, fertilizers, pesticides, plant protection, etc. Lift irrigation from a well or river is much more costly than flow irrigation from canal. It would, therefore, be advisable to give preference to such producers who receive canal irrigation in all the seasons. A whole village in the command of irrigation project can take up this work provided all cultivators in the village join the programme. We will then call it a 'hybrid seed village' and extend all necessary facilities by way of supplies, technical guidance and supervision. The Irrigation and Power Department will also be approached to supply assured water whenever required.

A processing plant costs about Rs. 1.00 lakh (Rs. 75,000 for buildings plus Rs. 25,000 for machinery). The capacity of a processing plant is about 500 to 750 acres. Since the produce is harvested at the ripe stage and not the bone-dry stage of the corn or grain, it is very necessary to dry the produce in the drying bins, grade it, apply pesticides and then bag and label it in the processing plant. This is a must. As such, 750 acres which will feed the processing plant should be preferably within a radius of 3 miles. If we locate areas at farther distances, then it would mean

extra heavy cost on transport which might have to be borne by the cultivator himself. From this point of view also the idea of 'seed village' or a cooperative lift irrigation society or *Sahakari Sakhar Karkhana* giving about 500 to 750 acres of land in a compact area is desirable.

In order to process the seed from 2,500 acres available in three seasons, it would be necessary to set up two processing plants in each district and the total requirement of processing units will be 40. From this point of view also, the need of having 'seed villages' with a compact area of 500 to 750 acres is obvious.

The cost of cultivation of hybrid seed is rather high and ranges from Rs. 400 to 500 per acre in case of jowar, bajra and maize. Naturally, only such cultivators or group of cultivators who can afford to incur such heavy expenditure of Rs. 500 per acre or are capable of getting crop loans should be given preference. Others can go in for commercial hybrid crop production.

The area of 2,500 acres on which hybrid seed programme will be undertaken may roughly be divided into 1,250 acres in *kharif*, 900 acres in *rabi* and 350 acres in summer season. This is a tentative distribution and there is no hard and fast rule about it. One may alter the proportion, keeping in view the availability of irrigation water, cost of lifting water and any other convenience.

The requirements of fertilisers for 2,500 acres under hybrid seed production programme will be 625 tons of ammonium sulphate, 415 tons of superphosphate and 76 tons of sulphate of potash; pesticides needed will be 930 tons of 10 per cent HHC and 15 tons of Endrin 20 per cent. These will be procured and supplied. Arrangements may be made to stock these in your district preferably in godowns belonging to cooperative societies or any other agency. You may also have to watch that these are used exclusively for hybrid seed production.

It may be necessary to stock the produce of hybrid seed in pucca godowns. The produce of 2,500 acres at the end of *kharif* season will be 625 tons or 1.25 lakh bags of 5 kg. each and at the end of *rabi* season will be 450 tons or 90,000 bags of 5 kg. each. These will have to be kept in

store for at least 3 or 4 months. Suitable godowns belonging either to the Agriculture Department or *Zilla Parishad* or cooperative societies or Warehousing Corporation in the vicinity of the processing plants which can store at a time at least half the quantity mentioned above, may please be located and reserved in time.

It may not be necessary to provide crop loans for all the 2,500 acres. If crop loans are provided say for 1000 acres in each district at the rate of Rs. 400 per acre, the amount required will be Rs. 4 lakhs. This can be paid back and reutilised for raising a second crop either in *rabi* or summer season in the remaining area. You may contact the central cooperative banks and in consultation with the District Deputy Registrar see that such crop loans will become available to hybrid seed growers.

The letter ended with a request to the *Zilla Parishad* Officers to give priority to this programme and communicate names of progressive cultivators, seed villages, cooperative lift irrigation societies, *sakhar karkhanas*, etc., by the middle of March 1966. They were also requested to indicate names of the towns where processing plants would be set up, giving details about availability of electricity, watersupply, labour and other facilities.

A letter from the Secretary, Agriculture and Cooperation Department of the state government dated March 5, 1966 addressed to all Superintending Agricultural Officers and *Parishad* Agricultural Development Officers with copies marked to the Director of Agriculture and Additional Director of Agriculture stressed the special importance of the high-yielding varieties programme as part of the intensive cultivation programme during the year 1966-67. The letter said, "The programme of hybrid seed cultivation for the next year will be of the order of over 45,000 acres under sorghum, 20,000 to 25,000 acres of maize and 5,000 acres of bajra during the *kharif*, *rabi* and summer seasons. This quantity of parent seed has got to be produced next year and every district should have a programme of its own and as much protected irrigation works as possible should be utilised in order to locate this acreage according to suitability and isolation

desirable for production of hybrid parent seed. Superintending Agricultural Officers may please discuss this in detail with their *Partishad* Agricultural Development Officers and take further instructions from the Additional Director of Agriculture and the Hybrid Seed Specialist, Dr. Sawant, at Bombay, and the necessary programme of selection of areas, posting and training of special and general staff, stocking of necessary quantities of seeds, fertilisers, insecticides, etc., may be undertaken forthwith." The letter drew attention to the role of the *taluka* seed farms in this connection. "Though we have opened practically all the *taluka* seed farms, some of the seed farms are not functioning well and are not utilising all the lands on these farms. The farms have not yet been fenced and the well and other irrigation potentials have not been fully utilised. Modern implements given to these farms are not being utilised. Government are anxious that these seed farms should be utilised to the maximum extent by taking 2 or 3 crops of improved varieties of seed and hybrid seed."

#### TRAINING OF OFFICERS

In a letter issued in March 1966 to all the Chief Executive Officers, the programme of training for officers in the technique of hybrid seed production was outlined. The letter said, "The Department of Agriculture is undertaking a large programme of hybrid seed production in the year 1966-67 and hence it is necessary to train a large number of officers and assistants in the technique of hybrid seed production so that the programme can be implemented successfully. In pursuance of this policy, it has been decided to hold state level, divisional level and district level training courses in the techniques of hybrid seed production in the month of April, 1966. The programme of training is:

April 4—6, 1966

April 11—13, 1966

April 18—27, 1966

State level

Divisional level

District level

be in overall charge of the State level training camp. The Superintending Agricultural Officers and the *Parishad* Agricultural Development Officers would fix up the venue of the divisional level and district level training camps which would be organised with the help of the officers trained at the state level camp.

#### COMMENTS OF THE IRRIGATION DEPARTMENT ON THE PLAN

The Master Plan for 1966-67 did not, however, appear to have been issued with the prior concurrence of the Department of Irrigation. The Irrigation and Power Department in their letter dated April 18, 1966 wrote to the Additional Director of Agriculture, Maharashtra State giving their comments on the Master Plan for hybrid seed production as follows. "While implementing the programme of hybrid seed during the current hot weather season, it has been observed that the areas for hybrid maize and jowar have been chosen further away from the irrigation systems, which has resulted in great strain in supply of water from irrigation systems. It is, therefore, requested that all such areas should be closer to the canal works, preferably at head reach and within perennial sections. Areas should be selected after prior consultation with the Irrigation and Power Department, so that it will be possible for this Department to assure availability of water well in time." The Under Secretary in the Irrigation Department requested the Additional Director of Agriculture, "to communicate to his Department and to the Executive Engineers/Superintending Engineers concerned the irrigable areas and names of the irrigators to whom water was to be supplied for hybrid seed by the following dates:

- |                               |                |
|-------------------------------|----------------|
| (i) <i>Kharif</i> season 1966 | April 1966     |
| (ii) <i>Rabi</i> season 1966  | September 1966 |
| (iii) Hot weather season 1967 |                |

desirable for production of hybrid parent seed. Superintending Agricultural Officers may please discuss this in detail with their *Partshad* Agricultural Development Officers and take further instructions from the Additional Director of Agriculture and the Hybrid Seed Specialist, Dr. Sawant, at Bombay, and the necessary programme of selection of areas, posting and training of special and general staff, stocking of necessary quantities of seeds, fertilisers, insecticides, etc., may be undertaken forthwith." The letter drew attention to the role of the *taluka* seed farms in this connection. "Though we have opened practically all the *taluka* seed farms, some of the seed farms are not functioning well and are not utilising all the lands on these farms. The farms have not yet been fenced and the well and other irrigation potentials have not been fully utilised. Modern implements given to these farms are not being utilised. Government are anxious that these seed farms should be utilised to the maximum extent by taking 2 or 3 crops of improved varieties of seed and hybrid seed."

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April 4—6, 1966	State level
April 11—13, 1966	Divisional level
April 18—27, 1966	District level

The State level training course would be organised at the Gram Sevak Training Centre at Manjri. The Officer in Charge, District Hybrid Seed Production and Research would

be in overall charge of the State level training camp. The Superintending Agricultural Officers and the *Parishad* Agricultural Development Officers would fix up the venue of the divisional level and district level training camps which would be organised with the help of the officers trained at the state level camp.

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(i) <i>Kharif</i> season 1966	}	April 1966
(ii) <i>Rabi</i> season 1966		September 1966
(iii) Hot weather season 1967		

The letter warned "that the rotation period for supply of water to hybrid seed cultivation will be allowed at 10-14 days interval as allowed for heavy crop like sugarcane and it is

not possible for this Department to change the above rotation programme from crop to crop merely because the irrigators demand and the District Agricultural Officers support the demand without convincing reasons and without considering the practical difficulties of the Irrigation and Power Department". In order to obviate any difficulty, the letter requested the Director to issue suitable instructions to the Chief Executive Officers and concerned Agricultural Officers to have prior consultation with the Executive Engineers concerned regarding the availability of water, well in advance, before the cultivation of hybrid seed every year.

Seed Production Officers, Agricultural Officers and Agricultural Assistants in different districts in charge of this programme joined by about February, 1966.

#### REPORTS FROM THE DISTRICTS

On the basis of the instructions issued by the Director of Agriculture, action was taken by field officers including different Chief Executive Officers and the office of the Director started receiving carbon copies of instructions given by different district officers.

There was for instance a DO letter dated March 14, 1966 from the Chief Executive Officer, Nasik, to the *Parishad* Agricultural Development Officer, *Zilla Parishad*, Nasik, inviting his attention to this important subject and requesting him to give personal attention to this matter. This letter also said "from the experience of the last two months, we have learnt a lesson of difficulties which come up due to lack of advance planning. I would, therefore, like you to attend to this reference personally, get in touch with all the officials and non-officials, prepare a detailed and exhaustive note on various points mentioned in the circular of the Additional Director and discuss the note with me, within 10 days positively. After getting all the first-hand information and preparing a self-contained report, I would like to discuss the matter with the office-bearers and concerned officers who will be involved in making this programme a success."

The *Zilla Parishad* Officer, Amravati pointed out that the cultivators intending to take hybrid seed production programme were contacted and, on the basis of the

relevant information, he felt that it was possible in Amravati district to have the intended coverage of 2,500 acres. Though the land proposed by him was unirrigated, it was approved because it was under assured rainfall. He also mentioned that the *Parishad* Agriculture Development Officer had contacted the District Cooperative Bank for short-term finance. Amongst the difficulties mentioned was short supply of fertilisers. If the sale and purchase societies were supplied with fertilisers, they could make arrangements for stocking and sale. He sent the information of hybrid seed production programme in his district for 1966-67 in the prescribed form.

The *Parishad* Agricultural Development Officer, *Zilla Parishad*, Jalgaon, pointed out that the cultivators wanted guarantee from the Agriculture Department and NSC regarding the minimum price of the seed.

The Satara *Zilla Parishad* Officer in his letter of March 29, 1966 sent a statement of allocation of 1,250 acres as between different blocks and said the villagewise and cropwise information, split up by targets, list of cultivators, etc., had been called for from the Block Development Officers concerned.

On March 18, 1966 the *Parishad* Agricultural Development Officer, Satara *Zilla Parishad* was pressing the Block Development Officers to send the requisite information on the basis of the decisions taken at the meeting of Agricultural Officers and Extension Officers, held on March 16-17, 1966 at Satara. The Satara *Zilla Parishad* tried to find out from the Divisional Soil Conservation Officer the area that could be spared by the *Taluka* Seed Farms for hybrid seed production during *kharif* 1966. He wrote urgent DO letters on April 9, 1966 to all the Block Development Officers asking them "to look into the matter personally and to arrange to send the required information immediately as desired by the Department" and marked a copy of this letter to the Director of Agriculture.

The Superintending Agricultural Officer, Nagpur Division, Nagpur, in his letter of April 14, 1966 to all the Chief Executive Officers requested them to ask the *Parishad* Agriculture Development Officers to finalise the planning of selected areas for hybrid seed production. The Agricultural Development Officer, *Zilla Parishad*, Nagpur, in his letter of April 28, 1966, pointed out that the matter was discussed in the *Panchayat*

*Samiti* meetings of the Block Development Officers, Agricultural Officers and Agricultural Extension Officers where the whole scheme was carefully studied on the basis of which two conclusions were arrived at, *viz.*,

1. The seed production programme is rather difficult on such a large scale to begin with and he therefore requested for the reduction of the target to 500 acres for *kharif* and 250 acres for *rabi* which appeared to be feasible.
2. He also felt that compact areas of 500 to 750 acres could not be obtained. He was careful to point out that this conclusion was based on survey and discussions.

The Superintending Agricultural Officer, Aurangabad, in his letter of March 17, 1966 to the Director of Agriculture, gave information about allocation regarding hybrid seed programme in different districts in his division.

The Agricultural Officer of the *Zilla Parishad*, Aurangabad in his letter of March 29, 1966 referred to the decision at the Divisional Extension Conference held on March 10-12 at Aurangabad in which a districtwise programme was fixed. The letter, however, did not indicate village-wise information.

The *Parishad* Agricultural Development Officer, *Zilla Parishad*, Sangli, in his letter of April 4, 1966 to the Additional Director of Agriculture, indicated that he had discussed with the Chief Executive Officer, *Zilla Parishad*, Sangli, and Chairman, *Shetakari Sahakari Sakhar Karkhana Ltd.*, Sangli, on the basis of which the programme was worked out covering the area assigned to the district. He also indicated that orders had been placed for equipment for two processing plants, standard size bags for hybrid seeds had been prepared and material known as 'Captan' for seed treatment had been obtained. He was, however, uncertain about the source of the seed and elicited information on the subject.

The *Parishad* Agricultural Development Officer, *Zilla Parishad*, Bhir, wrote on April 20, 1966 directly to the Secretary, Government of Maharashtra, Agriculture and

Community Development enclosing a break-up of the block-wise targets.

The *Parishad* Agricultural Development Officer, *Zilla Parishad*, Poona, proposed 400 acres seed production block at Bhavarapur *Taluka* Haveli and 200 acres in a compact area of three to four villages in Baramati. He, however, felt that sowing jowar seed in February was very late and was likely to be affected by flea beetles. He, therefore, sought information regarding the suitable season for sowing.

On April 27, 1966, Chief Executive Officer, *Zilla Parishad*, Dhulia, wrote to the Block Development Officers and Assistant Block Development Officers enclosing *talukawise* and crop-wise break-up of the allotted targets for hybrid seed production (foundation). He pointed out that the programme had been organised from the district level in view of urgency and convenience and asked the Block Development Officers to put up the programme before the *Panchayat Samitis* for information. The Bank authorities had been asked to sanction crop finance up to Rs. 400 per acre well in time to achieve the full targets. The letter asked the Block Development Officers to send the selection of cultivators in groups with maps and supporting information to his office immediately. It also asked for adequate arrangements for storage of seeds, manures and pesticides.

One of the points of coordination at the level of implementation in the district was the need to keep the Executive Engineer appraised of the dimensions of the programme within the district. A letter from the Chief Executive Officer, *Zilla Parishad*, Dhulia, to the Executive Engineer of Dhulia is an example of this. It says, "The success of the programme entirely depends upon the cooperation of your department in extending the irrigation facilities, so much so that even the defaulters who are included in this programme will not be deprived of these facilities. A complete list of cultivators alongwith the map will be received by you shortly through the Block Development Officer, Dhulia".

#### ADVICE OF AN INSTITUTE OF RESEARCH

While this was the official planning and implementation of the programme, an institute of study and research also started

taking some interest in the programme. Shri K. G. Joshi of the Institute of Regional Development Planning, Kadamwadi, Wardha, wrote to Shri Vaidya as follows:

I find that in spite of training of the campaign officer, there is no clarity of thinking on the part of the *Zilla Parishad* Officers with respect to the hybrid seed. He made the following suggestions regarding the implementation of the programme:

- (i) As far as possible hybrid seed production should not be taken up under unirrigated conditions; the area should be irrigated either by canals or by lift irrigation from wells or rivers.
- (ii) Crops to be grown for hybrid seed production of jowar and bajra should invariably be grown as off-season crops.
- (iii) Hybrid maize could be taken up during the main growing season; maize not being a common crop, there would be no difficulty in isolating the seed production area by 200-300 meters from other maize areas and detasseling the crop within the isolation limits.
- (iv) For hybrid seed production of bajra, there would be no difficulty of isolation even if this crop is grown in the *kharif* season from June to October in the Vidharbha region, to some extent in Parbhani and Nanded districts of Aurangabad division and Jalgaon district of Bombay division but in Poona, Ahmednagar, Satara, Sholapur, Nasik and Dhulia districts, it would be difficult to isolate this crop by 200-300 meters from other bajra fields. In this region, instead of growing this crop in the *kharif* season, it would be better to sow this crop between August 15 and September 15, so that flowering of this crop does not clash with the normal *kharif* crop and the question of isolating this off-season crop from the main crop does not arise. Since both parents of hybrid bajra are very amenable to ratooning, a second crop from

November to February would also be possible.

- (v) In the Vidarbha region, jowar hybrid seed production should not be attempted in the normal *kharif* season. Thus, on the whole it would be more feasible to grow the crop in the off-season than making efforts in isolating the crop by growing it in the normal season.
- (vi) The area under hybrid seed production should start with a green manuring crop of sunhemp which should be sown with the rains in June or July and ploughed in by about August end. Bajra crop could be sown from August 20 to September 15. This crop would be ready for harvest by end of November or first week of December. It would be ratooned thereafter and the second crop taken by the end of March. As far as jowar is concerned, green manuring would be completed by August 15, and the area would be sown from September 20 to October 5. This crop would be over by the end of December or the first week of January and it would be ratooned and the second crop would be taken by the end of April. The advantage would be that from the same area under hybrid seed production of jowar and bajra, two crops could be taken every year.

The letter concluded by saying that the thinking at the district level at present was very confused and it would be very difficult for *Parishad* Agricultural Development Officers to handle the programme of hybrid seed production on an area of 2,000 to 3,000 acres, unless they had clear ideas.

In pursuance of this letter, further instructions were issued by the Director of Agriculture to the Chief Executive Officers of *Zilla Parishads* in May 1966. The main points in this letter were:

- (i) the area selected should be in compact blocks;
- (ii) the programme was to be undertaken under irrigated conditions either under canals, lift irrigation or wells. Areas under canals must be close to the head works,

preferably within 5 to 7 miles;

- (iii) areas should be selected for hybrid seed production in consultation with the officers of the Irrigation and Power Department. They should be informed about the requirements of water for hybrid seed under different seasons by the following dates:

<i>Kharif</i> season	}	May 1966
<i>Rabi</i> season, 1966		
Hot season, 1967		September 1966

- (iv) full information regarding the areas selected, the survey numbers, the names of cultivators, villages, location, date of sowing, etc., should be given to the local seed production assistant of NSC and to the Senior Agricultural Inspector of NSC as also the Department; and
- (v) a register of certified growers should be maintained.

The letter also embodied the suggestions made by the Wardha Institute regarding the season for maize, bajra and jowar so that there would be no clash between these crops and the normal season (*kharif*) crops. This would facilitate isolation.

Apart from the precaution to ensure that the flowering of seed crop did not clash with the flowering of the normal crop, the letter also mentioned that precaution should be taken to ensure that the rainy season was avoided in the growth of the seed crop. The time of sowing would have to be adjusted accordingly.

#### ARRANGEMENTS FOR THE SUPPLY OF SEED

As regards the arrangements for the supply of seed, the letter said, "Arrangements for obtaining foundation seed of parents maize, jowar and bajra from NSC are being finalised. As soon as the seed is available, a telegram would be sent to you. On receipt of the telegram from the department, the Agricultural Officer or any other responsible officer should be sent post-haste to Poona for collection and transport of the seed to the respective places. The seed that would be sup-

plied would be for the requirement of all types of seed growers. Agriculture research Stations, *Taluka* Seed Farms, Trial-cum-demonstration farms, certified seed-growers registered with NSC and for the areas selected by the *Zilla Parishads*. On receipt of the seed at your end, full requirements of these categories should be met from the allotment made to you." The letter contained the proforma to be filled by farmers interested in the production of certified seed.

A record of the meeting held at Poona on May 4, 1966 attended by Dr. Shaikh, Dr. Vaidya, Dr. S. C. Sawant, Officer on Special Duty and other local officers of NSC contained the following points regarding arrangement for the supply of seed:

1. It was agreed that the foundation seed would be made available to the Maharashtra Government by NSC for multiplication during *kharif* 1966 as follows:

Sorghum	28,000 acres
Bajra	6,000 acres
Maize	8,000 acres

Maharashtra Government was very keen to have all the foundation seed as early as possible and in any case not later than 3rd week of June 1966. Fifty tonnes of MSCK 60 were being imported mostly for Maharashtra Government, although it was doubtful whether the seed would reach Bombay before June 20. A telegram was sent to the Ministry of Supply at the request of Dr. Shaikh asking them to despatch the seed by direct sailing passenger boat to Bombay so that the seed could reach Bombay, if possible, by June 15, 1966. Dr. Shaikh indicated that, if necessary, Maharashtra Government would be prepared to bear the air-lifting charges, if the arrival by sea was likely to be delayed. It was, however, agreed that Maharashtra would be supplied foundation seed for 15,000 acres from local production; the rest would depend on the arrival of seed from abroad.

2. Dr. Shaikh was emphatically of the view, that under no circumstances, NSC should contact directly the seed producers in Maharashtra and if they did the Maharashtra Government might not be in a position to supply the necessary in-

puts for the seed multiplication programme of such producers. Their experience with the existing seed producers/growers which NSC had in Maharashtra was not very happy. Most of them were acting as middlemen and were exploiting poor cultivators from whom they were purchasing unprocessed seed at very cheap rates, processing it in the plants and selling it at exorbitant prices. Such an arrangement would create serious difficulties. Maharashtra Government, however, had no objection to the NSC forwarding any requests received by them to the Maharashtra Government and they would be willing to enter into contract, on the same basis, with that of other cultivators. The seed multiplication programme was earmarked as follows:

Twenty thousands acres with the farming corporation in large blocks, 3,000 acres in *taluka* seed farms, additional 3,550 acres at *taluka* irrigation farm and 2,500 acres in each of the 20 districts chosen by them. Compact and large blocks as far as possible would be selected so that concentrated technical supervision could be provided by the state government as well as NSC. While the State Farming Corporation and the *taluka* seed farms had the necessary technical staff, one Hybrid Seed Officer, one Agricultural Supervisory Officer and four Agricultural Assistants will be in charge of the high-yielding seed multiplication programme.

Meanwhile, confusion arose regarding the seed growers selected by the department and those who directly approached NSC. The confusion is reflected in the following letter of May 23, 1966 from Shri Y.R. Mehta, General Manager of NSC to Dr. Vaidya: "In the *kharif* season, you have planned to raise 6,000 acres under seed production of hybrid maize, 15,000 acres under hybrid jowar and 4,000 acres under hybrid bajra. We have received applications from private people for 1,803 acres for maize, 2,215 acres for jowar and 655 acres for bajra. I have also learnt that your list also includes some private people who have also approached us for supply of foundation seeds. This is causing a lot of confusion. I shall, therefore, be obliged if you could kindly indicate immediately whether the total acreage to be put under seed production in *kharif* season for maize, jowar and bajra respectively under your programme includes those of the private

farms and if so, kindly indicate the parties included in your list." In reply, Dr. Vaidya pointed out that the planting programme for production of hybrid seeds during *kharif* 1966 had since been revised and it was planned to raise 28,000 acres under seed production of hybrid sorghum, 8,000 acres under hybrid bajra. This programme was discussed with Government of India Team on high-yielding varieties programme at Bombay, on March 27, 1966 and in subsequent discussions with the Dy. Commissioner (seeds) of the Union Ministry on May 4, 1966. It was then agreed that NSC would supply full requirements of foundation seed for planting the acreage planned under hybrid maize and bajra seed production while in the case of sorghum, foundation seed for 15,000 acres would be supplied by NSC from local production and for 13,000 acres from the seed which is being imported from USA. He, therefore, requested NSC immediately to issue release order to NSC unit at Poona to supply this quantity of seed to them.

As regards the supply of foundation seed to certified seed growers already registered with NSC, the Director pointed out, "Maharashtra Government has no objection if the foundation seed is supplied directly to them by NSC according to their planned requirements in view of your desire to keep liaison with these growers who made pioneering efforts in hybrid seed production. It would, however, be desirable that NSC does not register any new seed grower except those who are already registered with it before March 31, 1965. Any fresh applications for registration may be forwarded to the State Department of Agriculture. NSC would also keep this department fully posted with the acreage planted and quantity of seed supplied to these growers in various seasons. It is not clear whether the demand mentioned in your letter is from old registered seed growers only or it also includes the demand of new applicants. It would be better if NSC supplies seeds directly to the old certified growers and forwards new applications to this department for their registration as seed growers. They would be supplied seed by the Agriculture Department. Arrangements have been made for the supply of necessary inputs such as fertilisers, irrigation, pesticides and finance to the hybrid seed producers registered with the

Agriculture Department.” The letter enclosed a list of certified seed growers whose requirements had been included in the Department’s planned programme for *kharif* 1966 and requested for the supply of foundation seed as mentioned. The letter concluded by again stressing that for proper coordination of work of hybrid seed production, it would be desirable that the supply of seed was channelled through the State Department of Agriculture which would guarantee supply of foundation seed to the seed growers of NSC.

On June 1, 1966, Dr. Y. R. Mehta, General Manager of NSC wrote to the Director of Agriculture giving revised targets regarding seed production programme which were indicated in Table 7.

TABLE 7

<i>Crop</i>	<i>Total Quantity of seed required (in quintals)</i>	<i>Seed production area required (acres)</i>
Maize	31,250	13,550
Jowar (Sorghum)	84,400	28,140
Bajra	12,000	4,000

The figures regarding total quantity of seed required were based on the targets of areas to be covered by improved seeds for the *rabi*-summer 66-67 and *kharif* 67. The letter pointed out that as the foundation seed stock was limited, the following production acreage for the *kharif* season was allocated as given in Table 8.

TABLE 8

<i>Crop</i>	<i>Seed production acreage allocated</i>	<i>Foundation Seed allocated</i>	
		<i>Female</i>	<i>Male</i>
Maize	6,000	90,000 TVK	30,000 TVK
Jowar (sorghum)	23,000	69,000 kg.	46,000 kg.
Bajra	3,500	3,500 kg.	1,750 kg.

The balance will have to be produced in *rabi* and summer

seasons. As regards the arrangements for the supply of seed, the letter pointed out that NSC would be responsible for supply of foundation seeds and also for the certification of the seed produced. The letter said, "We would be supplying foundation seed as soon as your firm commitment and despatch instructions are received. The seed could be received at regional locations and then distributed from these places among seed growers of that region. Please give your despatch instructions at the earliest because the foundation seed is to be despatched from various production centres. It will take some time to arrange for supply".

For facilitating certification work, the letter informed that a certification centre had been opened at Poona. As regards the financial arrangements, the letter said, "It is the policy of NSC to recover the cost of foundation seed as also the inspection fee in advance. For the seed production acreage allocated to you, the charges on account of these are indicated in the Table below:

TABLE 9

<i>Crop</i>	<i>Cost of foundation seed per acre (Rs.)</i>	<i>Inspection fee per acre (Rs.)</i>	<i>Cost per acre (Rs.)</i>	<i>Seed Production acreage planned</i>	<i>Total cost (Rs.)</i>
Maize	80	25	105	6,000	6,30,000
Sorghum	40	25	65	23,000	14,95,000
Bajra	18	25	43	3,500	1,50,500
TOTAL					22,75,500

A request was made for remission of this amount to the Corporation.

As regards the applications from farmers directly received by the Corporation, the letter said that all these applications would be forwarded to the Director. The letter concluded by requesting early action to be taken since sowing time was fast approaching.

In reply to this letter, Dr. Vaidya pointed out that the hybrid seed production programme during *kharif* 1966 and

the seed requirements would be as given in the Table 10.

TABLE 10

Area in acres		Seed requirement	
		Female parent	Male parent
Sorghum	28,000	84,000 kg.	56,000 kg.
Bajra	6,000	6,000 kg.	3,000 kg.
Maize	8,000	120,000 TVK	40,000 TVK

The letter requested for the immediate release order for the supply of foundation seeds. As regards payment of advance, the Additional Director pointed out the difficulties under the treasury rules which required that further advances could not be drawn in the absence of accounts for previous advances. He, therefore, requested NSC to send a bill of the cost of the quantity of seed at the rates given by them, in advance, to enable him to arrange for its payment. As regards the supply of foundation seed to the farmers directly approaching NSC, the Additional Director said that NSC should ask the farmers to contact Agricultural Development Officers of the *Zilla Parishads* and also send a list of these farmers.

#### DIFFICULTIES IN IMPLEMENTATION

Some difficulties were experienced in the implementation of the programme. These were discussed by the Additional Director with Shri Veeraraghavan of NSC. These were:

- (i) The seed processing assistants of NSC, required to be present at the time of harvesting, were not readily available, as a result of which harvesting was delayed exposing the crop to damage by birds and/or rains. It was, therefore, agreed that *Parishad* Agricultural Development Officers would be allowed to harvest these crops in the presence of either the Hybrid Seed Production Officer or Lecturers in Botany of the Agricultural colleges or gazetted assistants of the office of the Millets' Specialist.

(ii) Similarly, the seed-production assistants at the seed

processing plants were not available at the seed processing plants; in their absence processing could not be undertaken. Shri Veeraraghavan immediately made arrangements to post seed processing assistants.

- (iii) In view of the year's scarcity condition, the seed was not plump, as a result of which large quantities were getting rejected. It was agreed to relax the grading standards of seed size in maize.

As regards the seed that would be available for the purpose of commercial distribution, it was agreed that the staff of NSC should not collect seed directly from the private growers for supply to other states. All the seed would be handed over to the department. In respect of maize, half the quantity would be released for the State while the remaining half would be given to NSC for supply to other states. In respect of jowar and bajra, two-thirds would be retained for the department and the remaining one-third would be given to NSC for supply to other states.

Under the hybrid seed production programme, a Hybrid Seed Production Officer, Agricultural Officer (HSP) and Agricultural assistants were appointed in every district.

#### PRESSURE FOR SUPPLY OF PARENT SEED

Meanwhile, the field officers started making enquiries regarding the supply of parent seed. For example, the Superintending Agriculture Officer, Bombay Division, Nasik, wrote to Dr. Vaidya on June 3, 1966: "You are aware that the cultivators are expecting rains by about June 10, 1966 and they are very anxious to have seed, both commercial as well as parent seed, before the rains actually start. I know that parent seed can conveniently be sold in the last week of June and the first week of July. But cultivators are not prepared to wait for the commercial seed. I am getting very pressing demands from all over the division, and it is absolutely necessary to give some approximate time limit in which we will be in a position to supply seed. When I contacted officers at Poona, I was advised to keep mum and to give no reply to any cultivator. You are, therefore, requested to let me know

the approximate date so that I can give some assurance to the cultivators”.

The letter of *Parishad* Agriculture Development Officer, *Zilla Parishad*, Wardha, of June 8 mentions the following difficulties:

- (i) Some of the cultivators undertaking hybrid seed production programme were defaulters due to bad season the previous year and their names were being dropped from preparing the Normal Credit Statement. He therefore, requested the department to move the Registrar, Cooperative Societies for the supply of finance to these defaulting cultivators.
- (ii) Even though some of the cultivators were not in need of credit, they were anxious to obtain manure and fertilizers. The stocks of manure had been reserved for hybrid jowar and maize cultivation but in the absence of receipt of hybrid seed, it had become very difficult to withhold these stocks any further. He, therefore, enquired whether seeds would be received by June 15 since the monsoon was fast approaching and the cultivators were not prepared to wait beyond June 15.

In his letter of June 17, the Superintending Agriculture Officer asked the Divisional Soil Conservation Officer, Aurangabad, to instruct his supervisor to proceed to Poona for lifting hybrid jowar foundation seed from the office of the Superintending Agricultural Officer as per the telegram of the Department.

There was also a demand from the Sugarcane Specialist, Padegaon, dated June 21, saying that lands had been kept ready, the canal was running and was likely to close in a couple of days and therefore seeds were badly required. The letter concluded with a request for immediate action.

Similarly, the Agriculture Development Officer, *Zilla Parishad*, Bhir in his letter of June 11, 1966 wrote as follows: “All preliminaries have been completed. Fields have been fixed and the ridges and furrows are being prepared. All the cultivators are waiting for seed which may kindly be allotted.

soon." He also suggested that arrangements for processing plants were very necessary, for which decisions had to be taken regarding location of the processing plant which should be ready by the time the crop was harvested.

On June 13, 1966, Hybrid Seed Production Officer, *Zilla Parishad*, Satara wrote to Shri K. R. Gupta, Technical Officer that the targets laid down by Government for production of hybrid had to be lowered as the cultivators were not ready to take jowar due to previous bad experience and he requested for the supply of seed for lower quantities.

The difficulties regarding the distribution of parent seeds continued all through June. The *Parishad* Agriculture Development Officer, *Zilla Parishad*, Dhulia, wrote to his Superintending Agricultural Officer that "growers are getting anxious to get the supply of seed" and he did not know what to say to the cultivators. He also brought to his superior's notice the fact that NSC had made direct offers of seed to some of the registered seed growers in his area. He felt that this sort of direct dealing with NSC would be more or less in contravention of the policy of the Director of Agriculture.

A letter on the same lines was also sent by the Chairman, Agriculture and Cooperation Subject Committee, *Zilla Parishad*, Dhulia, to Shri P. K. Sawant, the Minister for Agriculture, Maharashtra State, Bombay. He pointed out that though they were doing their best to finance the cultivators, the supply of parent as well as commercial seeds was being delayed, thus disturbing the faith in the entire programme. At the same time, direct dealing by NSC was creating misunderstandings and was also likely to lead the cultivators to lose their faith in the agency of the *Zilla Parishad*. A reply to this letter of the Chairman was sent by Dr. Vaidya in which he said, "I have already supplied to your district jowar foundation seed for 100 acres and you must distribute it to the cultivators so that they can start sowing. An additional quantity of jowar foundation seed for 83 acres has also been sent and must have reached your district or will reach in a day or two. The remaining quantity will be sent within this week. As regards foundation seed of hybrid maize and bajra, it has to be supplied by NSC from Delhi and Karnal respectively. However, we are

reminding NSC every day and hope it will be available within the next 7-10 days”.

A registered seed grower, Shri Prakash Chand Lunavati wrote from Amravati on June 29, 1966, “I have purchased the required fertilizers, pesticides and made all the arrangements and my land is ready for sowing of seed crop now. I was informed that parent seed would be supplied to me through *Parishad* Agriculture Development Officer, Amravati. But the same has not been received so far. I would request you kindly to arrange to send the parents at your earliest convenience”. This letter was forwarded by the office of the Director on July 7, to the *Zilla Parishad* Officer, Amravati, asking him to supply the foundation seed out of the district quota. The Agriculture Development Officer, *Zilla Parishad*, Amravati, was one of the late Latifs who sent the particulars about the seed production programme in his district only on June 24, 1966 in the prescribed proforma. On July 14, 1966 the office of the Director of Agriculture sent a letter with the following observation to the *Zilla Parishad*, Amravati, “The sowing of hybrid seed crops in unirrigated condition should be totally cancelled and only the area under irrigated condition should be sown under hybrid seed crops. The area under hybrid seed production during *kharif* season for Amravati district would be reduced to that extent.” The Director pointed out that the seed supplied to the district was in excess of the requirements of the reduced area.

Aware of the pressure from the districts for the supply of foundation seed, the Secretary, Agriculture and Cooperative Department, sent a letter on June 17, 1966 to all the Cooperative Education Officers of *Zilla Parishads* with copies to the Director of Agriculture. The letter said, “Frantic efforts are being mooted from the districts for hybrid parent seed to be sown immediately in the districts. Our Hybrid Specialist and NSC have advised us that the sowing should be done between July 5 and July 20 and they expect that foundation seed which is under processing in Walchandnagar for the last 10-15 days and the seed which is arriving by ship from USA between June 22 and June 27 will be rushed to the districts by trucks as per allotments already made. We expect the seed to be in the districts by the 28th of this month and it should be

issued to the seed growers immediately and delivered if possible at their farms immediately thereafter for being sown according to schedule. The farmers should not be allowed to get worried about the seed as we have enough foundation seed at Walchandnagar and the documents pertaining to the consignment on the ship loaded in USA have already arrived”.

On July 22, 1966, the following circular letter was issued by the Director of Agriculture to all the Cooperative Education Officers: “The Department has already distributed foundation seed of jowar, bajra and maize hybrid seed to the various districts against the fixed targets. It is hoped that the foundation seed has been received at your end and has been further distributed to the cultivators who are participating in the programme of the hybrid seed production in the current season. It is hoped that villages in compact blocks have been selected and sowing of the seed crops in such villages is completed”. The letter asked for complete information about the names of cultivators, names of villages and the area sown under seed crops so that the information could be sent to NSC, whose assistants could inspect and supervise the villages, as and when necessary.

#### REPORTS FROM DISTRICTS

The Agriculture Development Officer, *Zilla Parishad*, Yeotmal proposed the utilisation of certified hybrid seed for further production of hybrid seed. The Director pointed out in his letter of July 13, 1966 that “hybrid seed has to be produced every year by planting two inbred lines or two single hybrid parents and crossing them”. Obviously, there was a considerable communication gap, both administrative and technical.

The information village-wise and cropwise under hybrid seed production from Jalgaon, *Zilla Parishad* came as late as July 6 1966. Meanwhile, individual requests and orders thereon continued. As late as July 26, 1966 the Director of Agriculture wrote to the *Parishad* Agriculture Development Officer, *Zilla Parishad*, Amravati that one Shri A.D. Ganerival might be supplied foundation seed since his land had been brought under irrigation.

Shri Veeraraghavan, Secretary, NSC wrote to Dr. Vaidya, Additional Director of Agriculture as follows: "I hope that the foundation seeds have been distributed in irrigated and well-drained areas only. This is the most important factor for proper management of the crop to ensure nicking. For proper certification of the crops, we should immediately have a list of persons who are doing the planting and the acreages and quantity of seeds supplied to them. Till now, we have not got the above particulars." A reminder was issued by the Secretary, Agriculture and Cooperative Department to Dr. Vaidya on July 20, 1966. On July 29, 1966 the Director replied to Dr. Shaikh as follows: "The Cooperative Education Officer of all districts where hybrid seed production has been undertaken are already instructed to prepare a list of persons and villages in each district who have taken up hybrid seed production programme during *kharif* season 1966 and submit the same to the Department and to NSC officers. As the sowings are not yet over, they have not sent the required information. As soon as the same is received from them, full details of the district-wise sowings will be submitted to government.

Meanwhile, odd requests for supply of seed continued to come in. One such request was from *Zilla Parishad*, Thana on July 21, 1966, regarding supply of seed to Adarsha Dugdhalaya, Palghar. The Director replied in his letter of August 3, 1966, that the request for supply of foundation seed of maize was too late. They were, however, advised to approach the Superintending Agriculture Officer, Bombay Division, Nasik.

Detailed information about the list of cultivators under hybrid seed production programme was sent by the *Zilla Parishad*, Agriculture Development Officer, Poona, on July 20, 1966. Similar information came from Agriculture Development Officer, *Zilla Parishad*, Kolhapur on August 3, 1966. The village-wise and crop-wise information of the hybrid seed production programme for *kharif* 1966 came from the *Zilla Parishad*, Bhir, with their letter of 27th July. The report from Satara came on 28th July, wherein it was pointed out that the sowing of the crops was still in progress due to

delayed rains and hence the final report would be submitted in due course.

Meanwhile, the Superintending Agriculture Officer, Nagpur wrote on July 14, wanting to know the exact dosage of fertilizers for hybrid jowar seed production, since there was some discrepancy between the figures given in the Bulletin on Hybrid Seed and those given in the reference from NSC.

Difficulties continued with NSC regarding their contacting directly the registered seed growers. The Agriculture Development Officer, *Zilla Parishad*, Ahmednagar, wrote on July 18, 1966 as follows:

NSC has supplied seed to some of the seed growers directly. This has the disadvantage in that the seed producers who have been supplied the seed through NSC will have to part with 33 per cent of the produce in favour of the Corporation. This means a substantial slice of the produce will be lost to the department, especially when the department is facing acute shortage of certified seed. The Corporation should not operate directly with the seed growers, thus interfering with the programme chalked out by the department.

Information from the various districts regarding village-wise and cropwise position was sent on different dates throughout August and September, 1966.

#### VARIOUS DIFFICULTIES

Observing on the selection of the seed areas, the Additional Director wrote as follows in August 1966: "It is seen from the villagewise and blockwise information that the area under hybrid seed production has been scattered over a very large number of villages." It was again pointed out how it would be difficult for the personnel of the department and the National Seeds Corporation to visit the plots for inspection, since harvesting would be at about the same time in all the places. It was decided that in future the seed production programme should be located in as few villages as possible and should be in compact blocks. This was another instance of failure of communication.

By the beginning of September, pressure started for the inspection of the hybrid seed crop. The Agricultural Development Officer, *Zilla Parishad*, Sangli, for example wrote to the NSC officer that jowar and bajra crops had already come up to the boot stage. He, therefore, requested them to chalk out a programme for inspection immediately.

Meanwhile, a circular letter of September 19, 1966, of Shri Anand Sawant, Officer-on-Special Duty (Hybrid Seed Production and Research) sent to all the *Zilla Parishads*, threw some light on the manner in which this programme was carried out during the year 1966. "In the recent statewide tour, it was repeatedly found that some of the jowar parent seed that we received was of inferior quality which has considerably affected the nicking. The seed had various defects. It was small, shrivelled, mouldy, broken, insect-infested, improperly processed and having no marks as to its germination percentage. Under these circumstances, the seed should be checked and rechecked before it is planted in order to avoid disappointment and failure of crops."

"This *kharif* season, we have planted smaller acreage than the acreage for which jowar parent seed was distributed. This has resulted in left-over seed at various *Zilla* centres and other sub-charges. It was found in some of these centres that the seed was improperly stored and the seed was getting mouldy or infested with grain weevil. This is a serious matter and immediate steps should be taken to inspect the seed, clean it and store it under proper conditions until next planting".

"On August 3, I had sent a letter requesting Agricultural Development Officers of *Zilla Parishads* and Estate Managers, Maharashtra State Farming Corporation, to furnish information on the acreage planted under seed production of the three hybrid crops and the parent seed left after planting. This information was due on August 20, 1966. Some did return the forms with information but others have failed." He, therefore, requested them to send the information before September 30. A copy of the letter was marked to the Plantation Manager, Maharashtra State Farming Corporation, Poona, to see that the seed was stored properly. There was, however, no instruction as to what proper storing meant.

## REVIEW OF PROGRAMME FOR KHARIF 1966

A note reviewing the programme for *khari*f 1966 details various points. Bulk of the jowar foundation seed, *i.e.*, about 30,000 kg. was received from USA in June 1966. It was contemplated previously that the foundation seed sown in early *khari*f would provide certified seed for use in *rabi* season 1966. Since, however, the sowings were delayed on account of delayed monsoon in the whole of Maharashtra by about a month, it was expected that certified seed would not be available till the beginning of December 1966, though small quantities might be available from the first week of October onwards. As regards processing plants, the note said that out of 8 plants, 4 had been set up and were in operation at Nasik, Kolhapur, Parbhani and Akola, while the remaining four were being set up at Manjri, Satara, Buldhana and Nanded. The Cooperative Sugar Factory, Sangli, had already its own processing plant. Besides this, Government had sanctioned 9 more processing plants to be set up at Nagpur, Wardha, Yeotmal, Amravati, Jalana, Dhulia, Bhir, Osmanabad and Sholapur. The Maharashtra State Farming Corporation was setting up a processing plant at Gangapur besides the two already set up at Walchandnagar and Chavdevnagar. Three processing plants were set up by private growers at Jalna, Phaltan and Shirampur.

## SEED PRODUCTION PROGRAMME : RABI 1966

A letter from Dr. Vaidya, Additional Director of Agriculture, to Dr. Shaikh, of July 27, 1966, gives the position regarding the achievements in *khari*f season 1966 and the programme for *rabi* 1966:

As against the target of 28,000 acres jowar, 6,000 acres bajra and 8,000 acres maize for the hybrid seed production programme during the *khari*f season of 1966, the seed received from all the sources including the imported seed was sufficient to cover 21,990 acres under jowar, 2,826 acres under bajra and 6,105 acres under hybrid maize. It is expected that ratoon of summer planted jowar crop will be approximately 300 acres out of 800 acres of successful jowar crop of summer 1966. Thus there would be a short

fall of an area of 5,710 acres under jowar, 3,174 acres under bajra and 1,895 acres under maize.

The targets fixed for hybrid seed production in *rabi* 1966 are given below:

Jowar	17,000 acres	(11,850 State + 5,150 Maharashtra State Farming Corporation)
Bajra	750 acres	
Maize	6,750 acres	

In addition to the above, it would be necessary to cover additional acreage to wipe out the shortfall in *kharif* season. Thus the total area to be sown in *rabi* season 1966, would be 22,710 acres jowar, 3,924 acres bajra and 8,645 acres maize. It is, however, observed that the area under maize crop in Maharashtra State is hardly 1 lakh acres more. The cultivators are also finding it difficult to sell the produce from the commercial crop as maize is not consumed as staple food in any part of the state. Hence the target under hybrid maize seed production can be conveniently reduced to 4,000 acres in *rabi* 1966. In case of jowar, it is expected that the seed growers will take a ratoon crop in *rabi* 1966 over at least 10,000 acres out of 21,990 acres under jowar in *kharif* 1966. It is not yet certain whether a successful ratoon crop of bajra can be taken. It will, however, be tried in *rabi* 1966 over a small area. Thus the total area required to be put under hybrid seed production and the foundation seed requirements for this area would be as given in Table 11.

TABLE 11

<i>Crop</i>	<i>Acres</i>	<i>Female parent</i>	<i>Male parent</i>
Jowar	12,760	37,280 kg.	25,520 kg.
Bajra	3,924	3,924 kg.	1,962 kg.
Maize	5,000	75,000 TVK	25,000 TVK

From the position of the availability of foundation seed of jowar with NSC, it may be assumed that CK 60-A seed,

*i.e.*, female parent of jowar hybrid, would have to be imported from the USA. As regards male parent of jowar, sufficient quantities would be locally available and procured. About 750 kg. of male parent of bajra hybrid is also available with the department.

It would, therefore, be necessary to import about 40 tonnes of CK 60 A seed from USA for use in the state during *rabi* 1966 and to make arrangements for supply of seeds of other crops from NSC. Please write to NSC to arrange for the import of 40 tonnes of seed of female parent of jowar and also to make arrangements for supply of 4,000 kg. of female parent and 1,250 kg. of male parent of bajra hybrid and 75,000 TVK female parent and 25,000 TVK male parent of Deccan double hybrid maize. It is essential that this seed is in our hands by the September 15, 1966 at the latest. If NSC places orders immediately, the seed from USA can be had in time even by cargo incurring less expenditure on freight.

I am sending a copy of this letter to Shri Veeraraghavan and Dr. Y. R. Mehta for information and taking advance action. You are, however, requested to confirm these requirements with NSC and request them for immediate action.

NSC was informed of the requirements of the quantity of foundation seed, though it was not definite how much they would be able to supply.

#### DISCUSSION WITH CENTRAL GOVERNMENT OFFICERS

The programme was further discussed at a meeting with the officers of Government of India held at Bombay on September 1, 1966 which was attended by Shri I. J. Naidu, Joint Secretary, Ministry of Food and Agriculture, Shri Hit Prakash, Agricultural Commissioner (Seeds) and Shri Y. R. Mehta, General Manager of the Corporation and Dr. Vaidya, Additional Director of Agriculture. A note recording proceedings of the meeting includes the following observations regarding the programme for the *rabi* season 1966:

As regards hybrid seed multiplication in *rabi* 1966 our programme has been drastically cut down under jowar. We

wanted foundation seed for 22,760 acres of which 10,000 acres will be under ratoon and the seed for remaining area of 12,760 acres is to be supplied by NSC. Shri Hit Prakash said that he is unable to supply any seed in *rabi* season because parent seed multiplication programme at Walchandnagar in *kharif* season has been inordinately delayed. The Maharashtra State Farming Corporation should have sown 700 acres under parent seed of hybrid jowar by now, while hardly 70 acres have been sown. This has caused a lot of concern both to Government of India and to the Department, as it would bring down the supply of foundation seed for *rabi* season and subsequently targets under commercial hybrid jowar in *kharif* 1967-68 would be reduced. Shri Naidu desired that Secretary, Agriculture and Cooperation Department should take up this matter urgently with Maharashtra State Farming Corporation so that the area is sown immediately, so that some seed might be available for sowing in late *rabi* season for certified seed multiplication. If that is not done, we will have to be content with whatever seed multiplication we have undertaken in *kharif* and the ratoon crop of the same in *rabi* 1966. As regards bajra, he has agreed to the target of 3,924 acres under foundation seed and to supply the required quantity of seed. This would be available by the middle of December 1966. Even though that is late, we have to sow it as we have no other source of bajra foundation seed. As regards maize, we wanted foundation seed for 4,000 acres. Shri Naidu expressed that we would have raised sufficient certified seed to cover 6 lakh acres in *kharif* season and in view of less demand for hybrid maize seed we should not multiply any certified seed in *rabi* 1966. He has, therefore, advised us to drop certified seed production of hybrid maize altogether in *rabi* season. As regards seed and fertilizer requirements for *rabi* seed multiplication programme, the figures mentioned in our note have been accepted.

#### FIELD INSPECTIONS

During his tour of some districts in September 1966, the Additional Director of Agriculture inspected hybrid seed pro-

duction plots of jowar, bajra and maize. During this tour, the district officers, seed producers and Superintending Agricultural Officers placed before him many difficulties regarding isolation distance found in seed multiplication plots, roguing of bajra seed multiplication plots and arrangements for processing of hybrid seed which was expected to be ready in a fortnight. These difficulties were discussed at a meeting on October 5, 1966.

The seed production assistants of NSC were required to visit the fields for inspection of crops and remain present at the time of harvesting, thrashing and then at the processing plants. As there were only 3 seed production assistants in a district, it was felt that it might not be possible for them to look to all these operations simultaneously. The following arrangements were therefore agreed to. As soon as the crop was ready for harvesting, the grower should harvest the male parent lines. After harvesting, the seed production assistant should be requested to inspect the crops. After his inspection, the remaining female lines could be harvested by the growers in the presence of the officers of the Agricultural Department, if the seed production assistant could not be present.

Whenever the area under seed crop was small, the harvested earheads from female parent lines should be transported to the seed processing plant for thrashing and other processing operations. Where the seed production area was in blocks of 50 or 200 acres, the harvested earhead or cobs should be dried in the sun and then thrashed in the village itself. But proper precautions should be taken and the whole process should be carried out in the presence of the seed production assistants. After the thrashing was over, the seed grains should be filled in gunny bags, marked and sealed in the presence of the seed production assistants or the Hybrid Seed Production Officers of the district concerned. This should then be transported to the processing plants for further operations of cleaning, treating, etc.

At the processing plants, cleaning should be done in the presence of the officers of the Agricultural Department. However, further operations in processing such as treating, bagging, certification would invariably be done in the presence of

the seed production assistant of NSC. The earheads or cobs of the crops brought to the processing plants from the villages would be thrashed at the processing plants after the same had been inspected by the seed production assistants of NSC and then processed.

The other difficulty was about roguing of bajra seed crops. The seed production assistants of NSC insisted on the roguing of all types of plants except those having grey colour earheads. It was felt that colour of the anthers or of the awns did not make any difference and such plants should not be rogued. The variation in colour of anthers or awns should not be taken into consideration. Shri Rana of the Corporation who was present at the meeting agreed on this point but said that he would discuss this in Delhi and let the Department have the views of experts in Delhi.

On the question of isolation distance in bajra, it was felt that it was very difficult to maintain isolation distance of 400 meters and 200 meters should be all right. It was decided that while a decision on the point would be taken by the Expert Committee at Delhi, so far as the standing crop was concerned, 200 metres would be taken as isolation distance.

#### REVIEW OF WORK DONE AND PLANS FOR 1967-68

The review of the progress made in the production programme 1966-67 and the programme for 1967-68 were discussed at a meeting of the Maharashtra State High Level Agricultural Production Committee at the Chief Minister's residence. The Committee noted with satisfaction the progress and particularly the fact that over 70 per cent of the total hybrid seed in the country had been produced in Maharashtra in 1966-67. It was decided to go ahead with the full programme for the next year. It was also decided to take advance action for the year 1968-69 to produce hybrid seed of jowar, bajra and maize as well as IRR 8 paddy over an area of 60,000 acres so that a total acreage of 70 lakh could be covered under high-yielding hybrid varieties of food crops in the State.

It has not been easy to piece together the picture of the process of planning and implementation of the hybrid seed production programme from its inception till 1966. Though

the office of the Director of Agriculture provides a window to the activities of planning taking place in the state government, Union Government and NSC, the Superintending Agricultural Officers, *Zilla Parishads* and District Agricultural Officers have played a considerable part in the implementation of the programme. So for a fuller understanding of the entire process, it is necessary to shift the scene of observation to these other offices also. Nevertheless, even the study of the proceedings in the office of the Director of Agriculture has revealed the immense complexity and intricacy of planning which proceeds from the level of Union Government down to the farms of individual cultivators. It is often stated that the implementation of agricultural programmes, as perhaps of others, requires a single line of command and obedience. That this is an over-simplification, can be seen from the fact that any such programme involves operations of multiplicity of agencies which are not always amenable to the application of the principle of unity of command.

To yoke together the activities of all these with their numerous units in a single programme is a very challenging task of organisation. There are many problems, for example, communication gaps, technical lacks, conflicts, overlaps, lack of coordination, lack of timely action, differences of views, etc. The bottlenecks indicated and the points of delay identified here ought to lead to progressive improvement in the process of planning and plan implementation.

## Appendix

### I. NOTE ON HYBRID MAIZE, JOWAR AND BAJRA

It is a well-known fact that yields of some cross-fertilised crops have been increased by taking advantage of heterosis obtainable by crossing two or more pure lines. This principle was also utilised in producing hybrid maize, jowar and bajra. In the case of hybrid maize, two pure lines were crossed and hybrids obtained. Since the male and female flowers are situated at two different locations on the same plant in maize, hybridisation is done by planting 4 lines of the female parent which is detasseled before anthesis (flowering) alternated by one or two lines of the male parent. In the case of jowar and bajra, the male and the female parts are situated in the same spikelet; hence production of hybrid seed is difficult in these crops. The usual method of emasculation and pollination will not be practicable for producing hybrid seed on a large scale. To overcome this difficulty, efforts were made to produce male sterile lines in these crops since 1929, and in USA they could establish male sterile lines by 1954 and the production of hybrid sorghum (jowar) started in that country since then. Male sterile lines were developed in bajra also. Once the male sterile lines are developed, it is not difficult to produce hybrid seed. Hybrid seed in jowar and bajra can be produced by planting alternately four lines of male of sterile variety and two lines of a good fertility restoring variety. The seed is set on the male sterile lines through wind pollination. This would be the hybrid seed to be sown by the cultivator to raise a high-yielding hybrid variety.

The Indian Council of Agricultural Research, New Delhi, in collaboration with the Rockefeller Foundation has so far developed four maize hybrids named Ganga 1, Ganga 101, Ranjit and Deccan. Of these, the Deccan double hybrid has been found to be suitable for the maize-growing areas of the state as was found after conducting trials thereof at some research stations in the state and at the college farms. This hybrid gives about 35 to 60 per cent more yield than the local

varieties. In 1964-65, the area under hybrid maize seed production was 30 acres in the state at three locations, namely, the Gramsevak Training Centre at Manjri (17 acres), the Taluka Seed Farm at Mohol (6 acres) and the Taluka seed Farm at Sholapur (7 acres).

The Indian Council of Agricultural Research with the collaboration of Rockefeller Foundation has also developed jowar and bajra hybrids. The jowar hybrid was developed by utilising *kharif*-60, a male sterile line (American male sterile line) and pollinating with some of the yellow endosperm varieties. The bajra hybrids were developed by crossing CMS Tift 23A and 18A male sterile lines (of African origin) with some fertility restorers like BJL 3-B, CMS 63, etc.

Work on transference of male sterility in Indian varieties was undertaken in 1958 at Parbhani and Nagpur in this state and, by the end of 1962, four maintainers' strains together with four male sterile lines were developed at Nagpur. The use of these lines is made in the production of hybrid jowar. In America, the work of production of hybrid jowar is going on since 1946 and they have developed jowar hybrids for grain, fodder, etc. However, since jowar is not used for human consumption, the quality aspect of grain is of no consequence there, high yield being the sole consideration. In India, jowar is a staple food of majority of the people in some of the states, especially Maharashtra. To overcome this difficulty, concerted efforts were made in this state to transfer the male sterility character of American varieties into Indian varieties and, as mentioned above, we have partly succeeded in doing so despite our limited resources of staff, land, etc.

During the last two years (1963-64 and 1964-65) 15 jowar hybrids developed by the Indian Council of Agricultural Research, New Delhi, were tried at Dhulia, Akola, Jalgaon, Digraj, Parbhani and Golegaon and it was observed that these hybrids yielded 23 to 220 per cent more grain over the respective check of standard state varieties. Of the hybrids tried, M.S.  $\times$  I.S. 84, M.S.  $\times$  I.S. 2930, M.S.  $\times$  I.S. 2931, M.S.  $\times$  I.S. 2933, M.S.  $\times$  I.S. 2938, M.S.  $\times$  I.S. 2945, M.S.  $\times$  I.S. 2953, M.S.  $\times$  I.S. 3798 and M.S.  $\times$  I.S. 1122 have in general

been found to be the best in grain yield and can be said to be adaptive enough. These hybrids mature within 90 to 100 days, while the local checks mature within 100 to 150 days. The above hybrids respond very well to high doses of fertilisation. The fertilisers applied were 60 to 100 lbs N and 40 to 60 lbs  $P_2O_5$  per acre depending on the location of the trial.

The bajra hybrids developed by the Indian Council of Agricultural Research were tried at Niphad and Vaijapur in 1964-65. It was observed from these trials that a bajra hybrid yielded 20 to 30 per cent more than the check (N. 28-15). The hybrids CMS 23 A×CM 63, CMS 23 A×BIL 3-B and CMS 101 A×BIL 3-B have been found to perform well in this state.

Last year (1964-65), trials of the Nagpur hybrid, *i.e.*, M.S. 22-5-16×Nj. 164 were taken at three places, *viz.*, Dhulia, Somnathpur and Nagpur. It was observed that this hybrid yielded 29 to 272 per cent more than the standard respective checks at these places. This year, it has been decided that trials of this hybrid along with promising Rockefeller hybrids should be taken at some of the research stations. It has also been decided at a meeting held in the Directorate of Agriculture with Rockefeller Foundation Experts that two promising hybrids, *viz.*, CSH 1 and M.S.×I.S. 3691 should be tried on all the Taluka Seed Farms and Trial-cum-Demonstration Farms in the jowar growing districts of the state.

The Indian Council of Agricultural Research, New Delhi, has recommended the release of CSH 1 (M.S. Kharif—60A×I.S. 84) and hybrid bajra No. 1 for commercial cultivation throughout the jowar and bajra growing areas of the country. The states have joined the coordinated sorghum hybrid project sponsored by the Indian Council of Agricultural Research in collaboration with Rockefeller Foundation and they have released the above hybrids for general cultivation.

Jowar hybrid seed production has been taken up by three progressive cultivators in this state under the supervision of the National Seeds Corporation. The Department has not taken up production of Indian Council of Agricultural Research jowar hybrids so far, since the recommended jowar hybrid has yet to be tried all over the state which is being done in this *kharif* season.

A separate scheme was submitted by the Millets Specialist, Maharashtra State, Parbhani, to the Department recently for the trial of maize, jowar and bajra hybrids and also for the production of hybrid seed thereof. Seed of the Nagpur jowar hybrid is being multiplied at the Agricultural College, Nagpur.

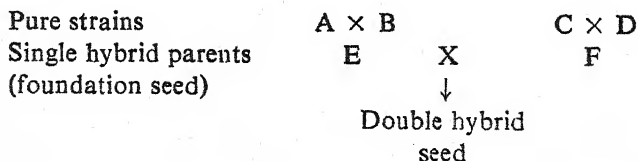
Since a separate scheme as mentioned above has been prepared and sent to the department for onward transmission to government, this project has not been included in the Fourth Five Year Plan, the allotment for the strengthening of research therein being too short of the requirements.

## II. NOTE ON PRODUCTION OF HYBRID MAIZE SEED

It is a well-established fact that hybrid seeds give higher yields compared to ordinary seeds due to heterosis, otherwise known as hybrid vigour. In order to exploit this natural phenomenon of hybrid vigour, the work of producing hybrid seed by crossing different varieties of maize was first started in USA. It was a great success. The hybrid seed gave anything from 150 per cent to 300 per cent more yield than the ordinary maize seed.

In India too, the work of hybridisation was undertaken under the aegis of Indian Council of Agricultural Research by importing pure bred strains of maize seed from USA in collaboration with the Rockefeller Foundation.

Briefly, the process of evolution of hybrid seed consists of making two single crosses of four pure bred strains of maize seed having desirable qualities and further crossing single hybrid to produce double hybrid seed as diagrammatically shown below:



The Indian Council of Agricultural Research has upto now evolved 9 improved varieties of hybrid maize under the

coordinated maize breeding scheme and these varieties are now recommended for large scale cultivation in the country under the auspices of the National Seeds Corporation. These varieties are :

<i>Name of the variety</i>	<i>Brief description</i>
1. Ganga hybrid Makka 1	An early hybrid recommended for Indo-Gangetic Plains.
2. Ganga hybrid Makka 101	A hybrid of medium maturity recommended for Western India.
3. Ranjit hybrid Makka	Recommended for Western India.
4. Deccan hybrid Makka	75 per cent to 140 per cent more yield. Recommended for peninsular India.
5. Double cross hybrid Makka VL-54	Recommended for Himalayan Hills, foot-hills and Indo-Gangetic Plains.
6. Ganga safed hybrid Makka-2	Recommended for Eastern and Western UP, Bihar, Bengal and North and Eastern Rajasthan.
7. Hi-starch hybrid Makka	Possesses greater percentage of starch. It has been released to meet the demand of the starch industry.
8. Ganga hybrid Makka-3	This hybrid possesses bright orange yellow fruit grains and has been released for Indo-Gangetic Plains.
9. Himalayan hybrid Makka-123	This hybrid is released to cater to the needs of the Himalayan region comprising different agro-climatic areas differentiated by latitude, altitude and rainfall pattern.

The Indian Council of Agricultural Research is the sole

agency for distribution and handling of inbred lines developed under the coordinated hybrid maize breeding scheme.

The work of production of foundation seed (single hybrid seed and pollinator parents) is now being undertaken by the National Seeds Corporation, in collaboration with the USAID and Rockefeller Foundation. Further work of distribution of foundation seed to certified seed growers, its planting, inspection of the standing crops, detasseling operation, harvesting, drying, processing, clearing, grading and finally packing in conveniently sized cloth bags, and sealing and certification is also done under the direct supervision of the National Seeds Corporation. □

# DELIVERY SYSTEM FOR IRRIGATION WATER THROUGH TUBEWELLS—A TECHNOECONOMIC EVALUATION (PAKISTAN)

## GOVERNMENT OF PAKISTAN

In Mona Unit, 138 tubewells were installed as a part of SCARP-II in 1965. The discharge of these tubewells varied between 2 to 4 cusecs and they were located in three types of canal commands, namely, perennial, non-perennial and un-commanded. The major part of Mona Unit covering 1,10,000 acres falls within perennial command. Since SCARP tubewells installed in the perennial command area far exceeded the combined total of tubewells in the non-perennial and un-commanded area, tubewell MN-51 in the perennial area was randomly selected for this study. Data regarding performance of the tubewell, annual pumpage and its impact on cropping intensity and crop production was collected. These parameters are discussed below.

### PERFORMANCE TESTING

The pump, motor and transformer being used on the tubewell (MN-51) are of different makes. During the first two years of operation, spare parts were readily available in stores but after sometime the stock of spare parts was exhausted and their procurement posed a problem as they were not locally available and involved foreign exchange for their import. Due to inconsistency in performance characteristics of the 'Byron Jackson' pump, as recommended by M/s Tipton and Kalmbach Incorporated, Wapda's consultant for SCARP, it was replaced with a locally manufactured KSB pump during 1970. Since then the tubewell is being successfully operated without any major pump problem as is evident from the periodical performance tests reported in Table 1.

There has been some decrease in the discharge of the tubewell since the replacement of the Byron Jackson pump with

TABLE 1 PERFORMANCE TEST DATA—TUBEWELL MN-51

Designed Discharge—3.5 cusecs  
(1571 gpm)

Period	Q	Specific capacity	DWL	SWL	D/down	Remarks
Final acceptance test.	1603	106.87	30.58	15.58	15.00	
1966	1125	119.00	29.71	20.30	9.41	
1967	1269	122.00	28.99	18.60	10.39	
1968	1010	109.00	27.49	18.25	9.24	
1969	1131	109.00	32.46	22.10	10.36	Impeller Adjusted.
1970	1156	—	—	—	—	
3/70	1687	120.50	34.00	20.00	14.00	New KSB pump installed
5/71	1595	104.00	38.00	22.70	15.30	
5/72	1609	106.00	35.40	20.25	15.15	
1/73	1476	93.00	35.90	20.10	15.80	
1/74	1483	94.00	33.00	17.25	15.75	
11/74	1476	102.00	33.31	18.80	14.41	
12/75	1303	99.00	29.50	16.00	13.50	
2/77	1313	101.00	29.00	16.00	13.00	
12/77	1280	96.00	29.70	16.30	13.40	
9/78	1297	101.00	26.50	13.60	12.90	
9/79	1288	105.00	25.70	13.50	12.20	

the locally manufactured KSB pump which can be taken as the normal feature of pumping equipment with lapse of time but no significant deterioration of tubewell bore hole due to incrustation or corrosion problems is evident from the performance test results. The overall performance of the tubewell (MN-51) has been found satisfactory and its efficiency is being maintained at an acceptable level. This is of course due to timely and proper maintenance action by the project staff.

#### ANNUAL PUMPAGE AND PERCENTAGE UTILIZATION

Annual pumpage and percentage utilization of tubewell MN-51 reported in Table 2 shows that the tubewell is giving satisfactory performance since installation in 1965 to date, i.e., April 1982. As is evident from the table, annual pumpage and percentage utilization was quite high during 1965-66.

to 1970-71. Percentage utilization varied between 50 to 86 per cent during this period as operation was not subjected to any restrictions. Restrictions were imposed on the utilization of the tubewells in 1971-72 and maximum utilization was fixed at 60 per cent. Tubewell pumpage was accordingly affected and decreased below 50 per cent. It is clear from the performance data that the tubewell has given satisfactory performance over 17 years and its condition is still good.

TABLE 2 ANNUAL PUMPAGE AND PERCENTAGE UTILIZATION OF TUBEWELL MN-51

<i>Year</i>	<i>Pumpage (Acre feet)</i>	<i>Percentage utilization</i>	<i>Remarks</i>
1965-66	1117.50	63.23	No restriction on utilization upto 1970-71
1966-67	1215.62	51.69	
1967-68	1328.64	49.99	
1968-69	1686.47	78.50	
1969-70	1160.32	86.16	
1970-71	1445.63	70.36	
1971-72	1278.30	55.16	Utilization fixed at 60 per cent (Max.)
1972-73	739.28	28.36	
1973-74	873.95	33.77	
1974-75	1244.37	54.38	
1975-76	849.99	35.98	
1976-77	1012.90	43.22	
1977-78	903.01	41.23	
1978-79	1052.14	46.21	
1979-80	1084.61	44.85	
1980-81	1100.57	45.97	
1981-82	945.88	43.70	

Authorized canal discharge for the tubewell (MN-51) command area was 2.62 cusecs. Annual water supply from the canal has been estimated as 19,955 acre feet. This canal supply has remained available without any change since 1965. In addition, supplemental water provided by MN-51 tubewell varied between 739 to 1,445 acre feet annually. Supplemental tubewell irrigation supplies have contributed substantially towards improvement in cropping pattern and intensity and to higher value of production.

## CROPPING INTENSITY

Cropping pattern and intensity representing pre-project conditions and the changes at 5 years interval are reported in Table 3. The table shows that the cropping intensity increased from 129 per cent in 1965-66 to 146 per cent in 1966-67 as a result of additional supply made available from tubewell pumpage. This improvement of about 17 per cent in cropping intensity can be attributed solely to additional supplies from tubewell. In 1971-72, a further improvement of about 3 per cent was recorded in cropping intensity. The increase in cropping intensity from 1976-77 onward was

TABLE 3 YEARWISE CROPPED AREA AND CROPPING INTENSITY—TUBEWELL MN-51 (PERENNIAL AREA)

(C.A.-372.72 Hectares)

<i>Crops</i>	1965-66	1966-67	1971-72	1976-77	1981-82
<b>KHARIF</b>					
Sugarcane	25.50	29.95	36.42	22.26	28.33
Cotton	82.56	57.47	48.56	48.16	12.14
Rice	9.71	3.24	4.05	12.95	8.09
Maize	6.88	—	—	—	—
Fodder	80.13	105.22	106.84	71.63	16.59
Garden/Vegetables	71.23	98.75	67.58	118.17	214.19
Mehdi	—	—	—	5.66	—
Misc.	—	—	12.14	4.86	4.86
Sub-total	276.01	294.63	275.60	283.69	284.20
<b>RABI</b>					
Wheat	112.50	80.94	137.60	132.74	156.62
Barley/oats	—	24.28	—	—	—
Oilseeds	0.40	—	4.05	3.64	1.62
Pulses	2.02	2.43	3.64	2.43	—
Fodder	57.06	48.97	46.94	60.70	33.59
Garden/Vegetables	34.00	91.06	87.41	103.20	127.88
Misc.	—	—	—	—	—
Sub-total	205.98	247.68	279.64	302.71	319.71
<b>GRAND TOTAL</b>	<b>481.99</b>	<b>542.31</b>	<b>555.24</b>	<b>586.4</b>	<b>603.91</b>
<b>Annual cropping intensity</b>					
	129.32	145.50	148.96	157.33	162.02

mainly due to watercourse improvement which was done by utilizing earthen improvement technology in 1976. Improvements from 1976 onwards are therefore mainly due to better conveyance and efficient use of water. The annual cropping intensity increased from pre-project figure of 129 per cent to 162 per cent in 1981-82.

Major changes in cropping pattern have been observed in case of cotton, fodder, wheat and garden vegetables. The area under cotton has been drastically reduced while there has been enormous increase under garden/vegetables. The area under fodder increased initially but has been considerably reduced by the latest year, *i.e.*, 1981-82.

#### GROSS VALUE OF PRODUCTION

The gross value of production of crops for the pre-project conditions are given for the year 1965-66 when only canal supply was available. The year 1966-67 shows the changes immediately after installation of the tubewell. By taking 1965-66 as the base year for the price index, gross value of crops has been estimated at five year intervals upto 1981-82. As reported in Table 4, the gross value of production of crops increased from Rs. 2,59,000 to Rs. 4,70,000 as a result of supplemental water supply from the tubewell. Due to better utilization of water, the gross value of production of crops continued to show an increasing trend and the maximum value of Rs. 7,18,000 has been recorded for the year 1981-82.

Although the increase in gross value in the later years is due to the combined effect of better yielding varieties and the adoption of improved agronomic practices, however, supplemental irrigation supply was certainly a key factor in the introduction of better production technology. The advantages of a supplemental delivery system of irrigation water through tubewells are apparent in terms of a dramatic increase in the gross value of production of crops as well as in optimizing the level of the water table. The objectives of the delivery system for irrigation water through tubewells have thus been fulfilled to a level much beyond our expectations at the project formulation stage.

TABLE 4 YEARWISE GROSS VALUE OF MAJOR CROPS  
TUBEWELL MN-51 (PERENNIAL AREA)

Crops	1965-66	1966-67	1971-72	1976-77	1981-82
<b>KHARIF</b>					
Sugarcane	32010.66	94093.11	88343.81	43473.78	69171.66
Cotton	16451.73	23663.27	20205.33	11793.42	4650.23
Rice	5695.50	2222.05	3095.42	10290.98	8417.16
Maize	3835.27	—	—	—	—
Fodder	29487.84	51999.72	68640.43	53099.32	12298.17
Misc.	—	—	—	—	—
<b>RABI</b>					
Wheat	57236.40	67475.63	152777.28	111119.23	171342.28
Barley/oats	—	10919.25	—	—	—
Oil Seeds	93.90	—	1140.86	1110.81	456.35
Pulses	374.36	495.37	809.50	540.40	—
Fodder	39371.40	36301.46	40596.06	59995.88	41500.45
Garden/ Vegetables	74240.00	183101.10	174700.00	284659.20	405935.88
Misc.	—	—	9600.00	9098.22	4503.40
<b>TOTAL</b>	<b>258797.06</b>	<b>470270.98</b>	<b>559908.69</b>	<b>585181.24</b>	<b>718275.58</b>

NOTE : Base year for price index: 1965-66.

# DELIVERY SYSTEM FOR FERTILIZER (REPUBLIC OF KOREA)

SI JUNG YOO

Korea has been traditionally an agricultural country and accordingly, fertilizer has been regarded by Korean farmers as one of the most important farm inputs. Furthermore, since the ratio of fertilizer expense to total agricultural production costs have been high, the government policies relative to fertilizer have been a matter of great concern for farmers. Accordingly, the fertilizer policy has been formulated and implemented on the principle that the use of fertilizer by farmers should be encouraged by easing the farmers' financial burden for purchasing fertilizer along with promoting its balanced application.

## HISTORICAL CHANGES IN THE DELIVERY SYSTEM FOR FERTILIZERS

### A. *Change of Handling Agencies*

#### *August 1945 to June 19, 1956*

During this period, the government or former agricultural cooperatives took over fertilizer supply business and supplied fertilizer imported with aid funds, but under the free economy system, fertilizer supply by the government faced considerable difficulties.

#### *June 20, 1956 to December 11, 1961*

Consequently, during this period, a multiple fertilizer supply system got instituted, i.e., Agricultural Bank, former agricultural cooperatives and private enterprises supplied fertilizer to farmers. The private enterprises, however, imported the best selling nitrogen fertilizer particularly ammonium sulphate and took a high profit by price manipulations. As a result, there were many problems hampering balanced application.

of fertilizer, stabilization of fertilizer price and the timely supply of fertilizer.

*December 12, 1961 to November 1983*

And so, since December 12, 1961, agricultural cooperatives have been designated as an exclusive agency for fertilizer distribution.

#### *B. Change of Fertilizer Supply System*

Since agricultural cooperatives were designated as an exclusive agency for fertilizer distribution, fertilizer supply system underwent some changes.

*Allocation by Crop Scheme (January 1, 1962 to September 30, 1970)*

Under this scheme, fertilizer was sold to farmers through allocating fertilizer by primary cooperatives (very small size).

But under the scheme, there arose many cases of misappropriation of fertilizer sale proceeds by village leaders. Also, farmers were rather reluctant to repay debt due to the joint liability.

*Free Selling by the Balanced Ratio of N.P.K. Scheme (October 1, 1970 to July 31, 1973)*

Under this scheme, farmers were allowed to purchase as much fertilizer as they wanted and they bought it in accordance with the criteria in which the ratio of nitrogen, phosphate and potash was 5 to 3 to 2. The debtor was the individual farmer.

Due to the shortage of fertilizer supply resulting from the oil shock in 1973, the free selling scheme was considered difficult for continuation.

*Allocation by End-User Scheme (August 1, 1973 to December 18, 1975)*

Under this scheme, fertilizer requirement was established on the basis of the area of farm to be cultivated by province as well as crop and also on the basis of optimum fertilizer quantity to be applied per unit of land. Fertilizer was sold only to end-users by farming period.

However, there arose several problems under this system. It was very difficult to estimate the area of land of individual farmers to be applied with fertilizer and a lot of paper work had to be done by primary cooperatives. Furthermore, farmers were forced to raise a large sum of money at a time since fertilizer was sold only thrice in a year.

*Tie-in Selling Scheme (December 19, 1975 to January 31, 1980)*

Under this scheme, farmers were free to choose any one among three sets of packages composed of fixed amount of nitrogen, phosphate and potash fertilizer. This tie-in selling scheme was aimed at attaining the balanced application of fertilizer.

Accordingly, farmers could purchase fertilizer as they wanted without any limitation of timing or quantity provided that they chose one of these three sets.

*Full Selling Scheme (February 1, 1980 to November 1983)*

Under this scheme, farmers could purchase fertilizer as they wanted without any limitation on the quantity and type of fertilizer or of timing. Due to self-sufficiency in fertilizer and the high standard of agricultural technology of farmers, this fertilizer supply system has been implemented since 1980.

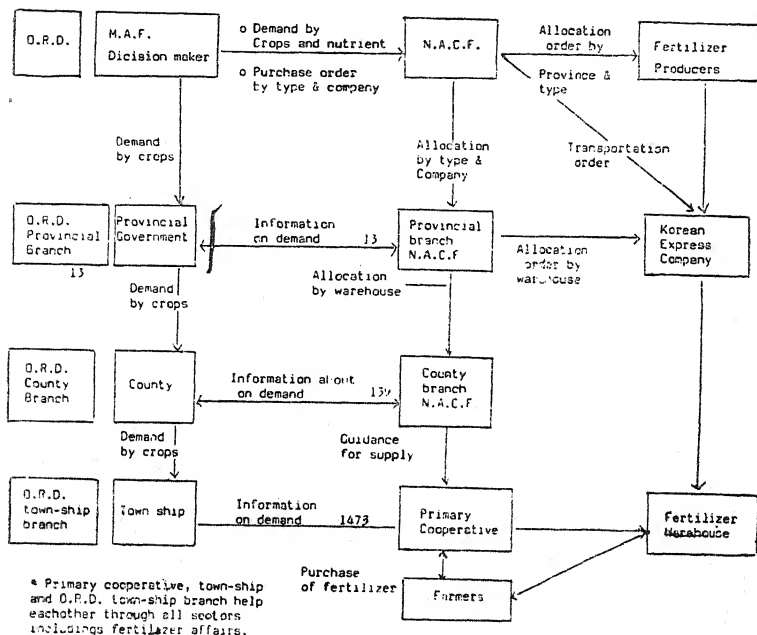
## THE DELIVERY SYSTEM FOR FERTILIZER

### A. Organization

The organization for delivery of fertilizer in Korea is divided into two parts. The first part is the National Agricultural Cooperative Federation (NACF) and the agricultural cooperatives. The second part is private shops. But the marketing share of NACF stands at about 95 per cent. Looking at Chart on next page.

1. NACF is distributor and wholesaler, primary cooperatives are retailers. And provincial and county branches of NACF act relay-roles between NACF and primary cooperatives.

CHART FERTILIZER DISTRIBUTION CHANNEL IN KOREA



2. Korean Express Company transports fertilizer from ex-factory to warehouses in rural areas.

## B. Function

### MAF

The Ministry of Agriculture and Fisheries (MAF) establishes annual fertilizer requirements by crop and nutrient on the basis of reports of planted area by crops submitted by administrative offices at the respective levels. City and provincial governments are given instructions in relation to the established fertilizer requirements by city and province, by crop and nutrient, from MAF.

Also NACF is given instructions from the government on the purchasing of fertilizer from fertilizer plants.

*NACF*

On the basis of fertilizer requirements established by MAF, NACF concludes contracts with fertilizer plants and informs the fertilizer plants of allocated fertilizer by city and province and gives instructions on the fertilizer transportation schedule to the Korean Express Company.

Meanwhile, each provincial branch of NACF allocates fertilizer by warehouse in rural areas on the basis of provincial allocation by NACF and informs Korean Express Company of the transportation schedule.

*Primary Cooperatives*

Primary cooperatives sell fertilizer to farmers as they want without any limitations of quantity, type of fertilizer or timing. Also, primary cooperatives perform guidance work relative to application of fertilizer in close cooperation with local administrative offices and rural guidance offices.

In recent years, in an effort to provide further convenience to farmers, primary cooperatives have been operating mobile fertilizer stores at village level during busy farming season and selling fertilizer on an year-round basis. Furthermore, agricultural cooperatives at respective levels run fertilizer demand-supply control centers for timely supply of fertilizer and inform administrative offices of the fertilizer demand and supply situation.

*C. Fertilizer Pricing System*

1. MAF decides all costs on fertilizer, for example, MAF decides purchasing price from factories, selling price to farmers and all marketing costs for the delivery of fertilizer.

*2. Price Policy*

(a) *Uniform-delivered Pricing*: Since 1962, NACF has supplied fertilizer including lime and silicate fertilizer to farmers throughout the country at a uniform retail price subject to MAF approval. This uniform price policy is aimed at equalizing the transportation cost burden in favour of the farmers located in remote areas. This policy has contributed greatly to speedy and easy pricing of fertilizer at the retail level and to favouring more fertilizer consumption in remote

areas. Another reason for this policy was that the fertilizer prices paid by the government were different among the manufacturers even for the same type of fertilizer.

(b) *Differential Pricing* : The government has maintained the fertilizer price policy since the early 1960's under the guiding principle that the balanced application of fertilizer should be promoted along with increase in total fertilizer consumption. Since many farmers prefer nitrogen to phosphate and potash fertilizer accordingly, the government has kept the price of phosphate, MOP and compound fertilizer at a relatively low price compared to the nitrogen.

(c) *Dual Pricing Policy* : The dual price policy is one of the indirect subsidy policies and means that the government supplies the fertilizer to farmers at a lower price level than its purchasing price including marketing costs. The difference between the selling price and the purchasing price is compensated for by the government budget.

This dual price policy has contributed to a higher consumption of fertilizer, to improvement in the application of fertilizer by type and to easing farmers' financial burden on purchasing fertilizer.

## CHARACTER OF THE DELIVERY SYSTEM FOR FERTILIZER

### *Marketing Share*

NACF and its agricultural cooperatives handle the majority of marketing. The marketing share of NACF stands at about 95 per cent.

### *Uniform Delivered Price*

Every farmer buys fertilizer at the same price everywhere throughout the year.

### *Transportation*

About 86 per cent of the total quantity of fertilizer is transported by train.

The fertilizer factories sell fertilizer on condition of ex-factory delivery; agricultural primary cooperatives receive fertilizer on condition of warehouse-delivery.

*Packaging*

Almost all the fertilizer is packed in 25 kg. bags.

*Credit System*

Every farmer can buy fertilizer on credit. Actually, however, the amount of fertilizer sold on credit is less than 25 per cent of the total amount sold.

*Operating Fund*

The entire operating fund of the fertilizer business controlled by government comes from the government fertilizer account.

## MERITS AND WEAK POINTS OF THE DELIVERY SYSTEM

A. *Merits*

1. The profit in marketing is comparatively small compared to foreign countries.
2. Farmers can buy at a lower price than the real price including marketing costs.
3. Farmers can buy freely on credit.
4. Transportation cost is comparatively lower.
5. Farmers can buy freely without any limitations, for example, of quantity, fertilizer type or time of purchase.

B. *Weak Points*

1. Service to farmers is relatively not as good as that provided by private merchants.
2. The burden of interest on the government fertilizer account is high owing to over-stock.

## FERTILIZER DELIVERY SYSTEM—DIRECTIONS FOR DEVELOPMENT

*Over-stock and Over-production*

The government must buy more than the necessary quantities of fertilizer owing to the contracts between the government and the joint-venture fertilizer companies. Therefore, government has to make an effort to amend the contracts and

to endeavour to increase export quantities of fertilizer.

### *Transportation*

Korea has good highway networks and good sea routes. But almost all the fertilizer is transported by trains owing to expensive truck and boat freights. From now on we will need to increase the transportation quantities of fertilizer by big trucks and big boats.

### *Electronic Data Processing System (EDPS) of Fertilizer Business*

Because of underdevelopment of EDPS of fertilizer business, we have problems as follows: (1) over-stock, (2) unbalanced stock by fertilizer types, and (3) long time required to transport fertilizer in certain cases. And so we have to develop EDPS for the fertilizer business.

### *Big Deficit of the Government Fertilizer Account*

Owing to dual pricing policy, the deficit of the government fertilizer account has been increasing year by year. Nowadays, the government cannot solve the deficit of the governmental fertilizer account with its own budget. For example, the deficit accumulation of the fertilizer account at the end of 1982 stood at US \$ 728,000,000. In order to clear up the deficit of the fertilizer account, the government plans to raise the fertilizer selling price year by year. In 1988, farmers would buy fertilizer at a price higher than the purchasing price including marketing costs.

Also by 1988, government is planning to supply fertilizer through the private marketing system, mainly agricultural cooperatives, without the intervention of government because government does not want to have the burden of big operating funds for the fertilizer business.

# DELIVERY SYSTEM FOR AGRICULTURAL CREDIT (JAPAN)

## GOVERNMENT OF JAPAN

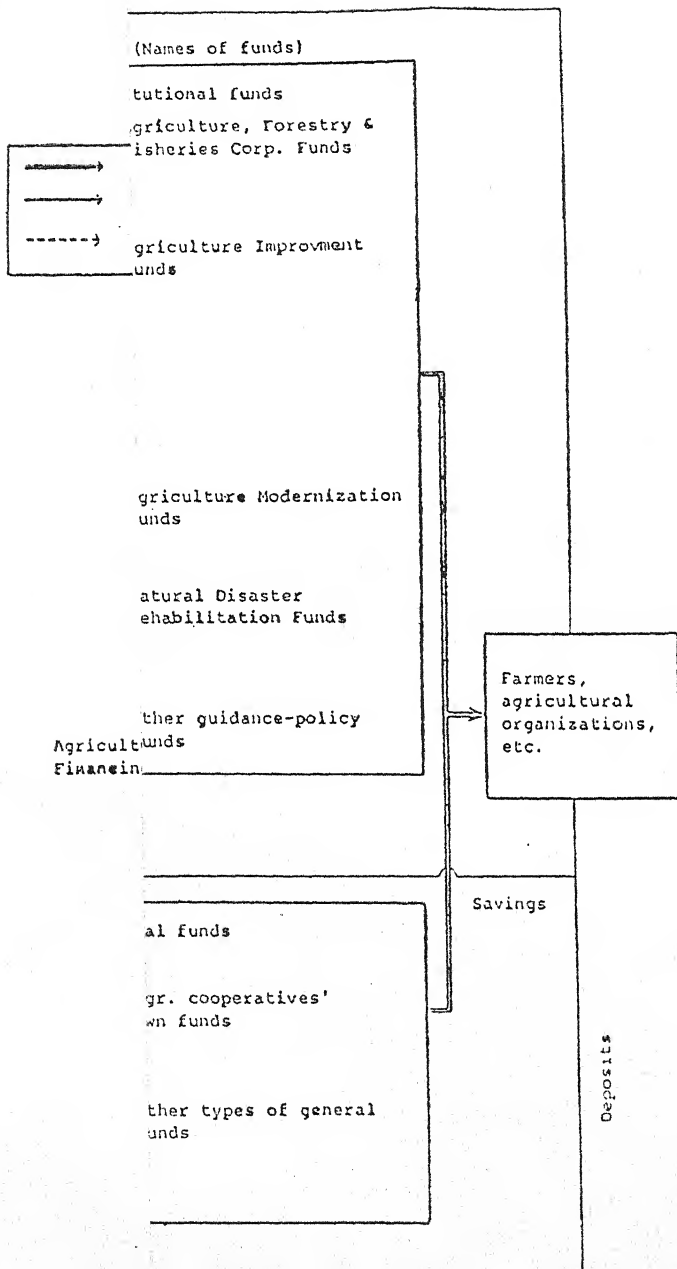
The agricultural credit system in Japan (see Chart 1) may roughly be classified into following three: (1) financing from government funds, such as, the Agriculture, Forestry and Fisheries Finance Corporation; (?) financing from the savings of farm households and others, such as, the funds operated by the financing organizations affiliated with the systems of agricultural cooperatives; and (3) financing from general funds, such as those of the commercial banks. The financing by organizations affiliated with the agricultural cooperatives may further be classified into: (1) loans to farm households, etc., from funds on which interest subsidies are given by the government or by local public bodies, such as those from the 'Agricultural Modernization Funds' and the 'Natural Disaster Rehabilitation Funds', and (2) loans to farm households, etc., offered by the agricultural cooperatives at their own expense, such as, the financing from the funds owned and operated by the agricultural cooperatives themselves.

Of the various types of agricultural financing mentioned above, an overall name of 'institutional financing' is given to cover the following two: (1) financing conducted with the government's own financial funds as the source, and (2) among the various types of financing conducted by organizations affiliated with the agricultural cooperatives (including the financing from general funds operated by other financing organs such as commercial banks), the series of policy-oriented financing in which the government or local public bodies grant interest subsidies or give debt guarantees.

### I. FARM HOUSEHOLD FINANCING

#### *Farm Households' Savings and Borrowings*

The trends of farm households' savings and borrowings also



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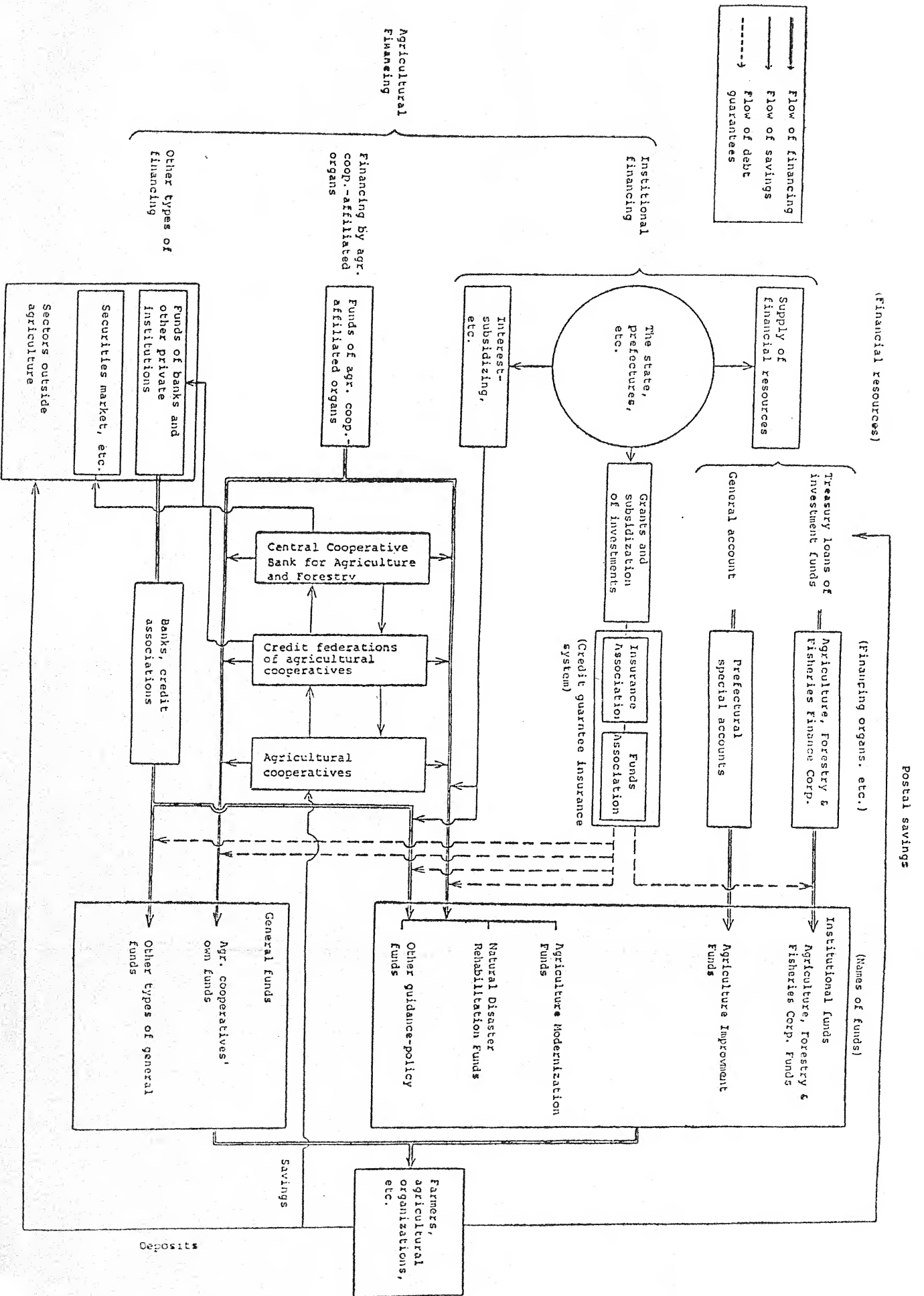
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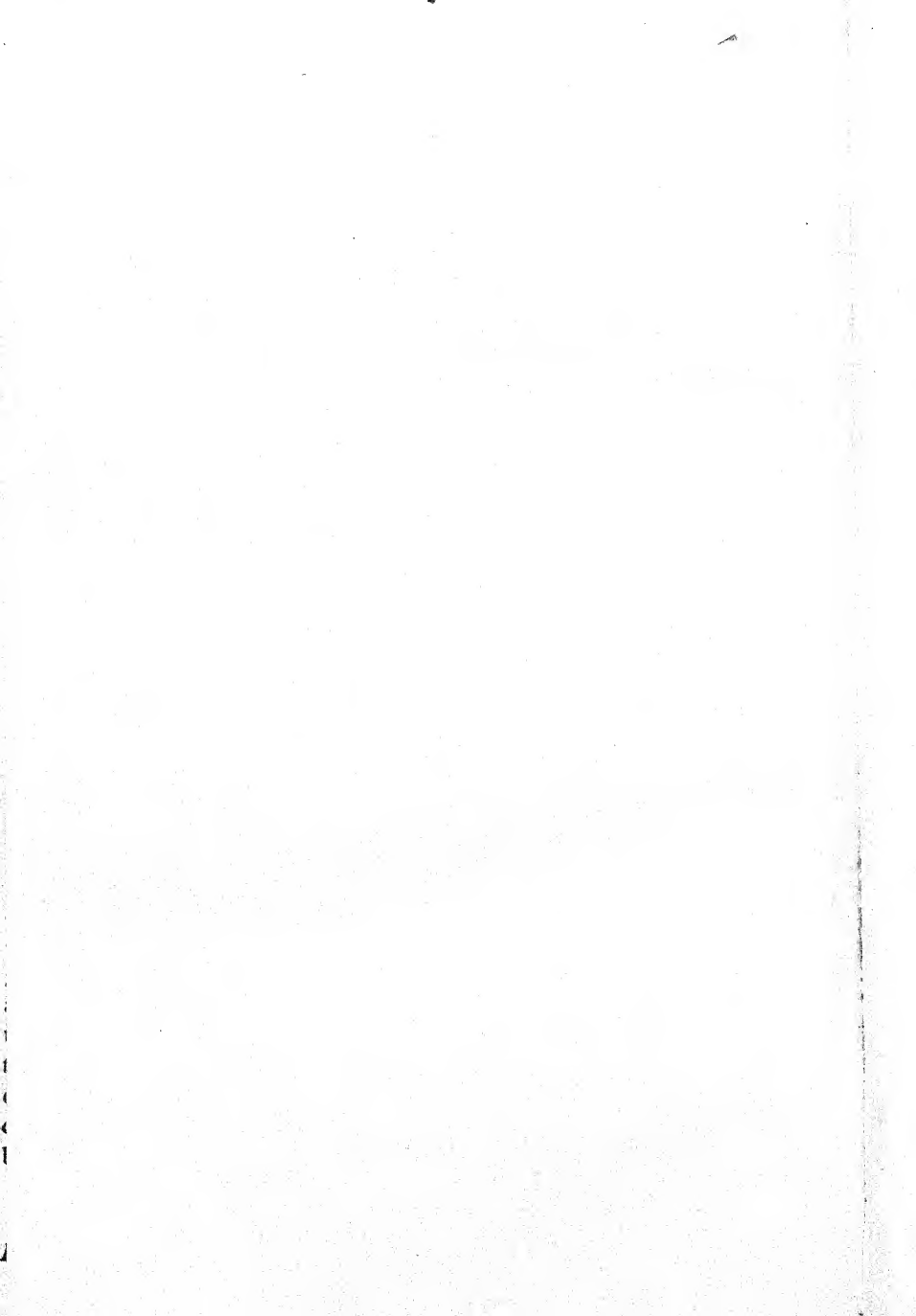
### I. FARM HOUSEHOLD FINANCING

#### *Farm Households' Savings and Borrowings*

The trends of farm households' savings and borrowings also

CHART 1 JAPAN'S AGRICULTURAL CREDIT SYSTEM





reflect those of the farmers' income and their economic surplus. There has been a gradual slowing down in the growth of their savings and borrowings since the mid-1970s as shown in Table 1.

TABLE 1 TRANSITION OF THE BALANCE OF FARM HOUSEHOLDS' SAVINGS AND BORROWINGS (PER FARM HOUSEHOLD, NATIONWIDE)

	FY 1980 amount (Y 1,000)	Annual Rate of Increase (%)						
		FY '65- 70	FY '70- 75	'76	'77	'78	'79	'80
Savings	9,655	18.0	21.1	15.2	13.1	13.3	11.2	11.8
Savings and Deposits (A)	6,723	18.9	23.4	15.0	11.9	13.2	10.7	10.7
Reserve	2,450	18.6	17.7	17.0	14.4	16.9	15.6	14.8
Securities	380	11.6	11.7	7.3	21.4	1.9	4.3	18.8
Borrowings (B)	1,629	20.2	17.1	20.1	11.6	14.1	10.0	14.9
Borrowings/ Savings Ratio (B)/(A)	24.2	17.4	19.0	23.4	23.3	23.5	23.3	24.2

SOURCE: The Ministry of Agriculture, Forestry and Fisheries, "Farm Household Economy Survey".

NOTE: Each of the 'Borrowings/Savings' ratios shown in the Annual Rate of Increase column is the ratio (B/A) for each fiscal year. The figures given under the columns for FY '65-70 and FY '70-75 show the ratios for FY 1965 and FY 1970, respectively.

### *Sources of Funds for Farm Households' Savings and Investments*

- (a) As regards the farm households' savings and investments into fixed assets, and their sources of funds, it is noted from the Chart 2, p. 186 that in fiscal 1980 the investments into fixed assets per household totalled 1,060,000 yen and the savings increased by 1,020,000 yen. The sources of such funds were the farm household economy surplus of 870,000 yen, depreciation reserve

**CHART 2 FARM HOUSEHOLDS' SAVINGS AND INVESTMENTS,  
AND THEIR FINANCIAL SOURCES (FY 1980,  
PER FARM HOUSEHOLD)**

<i>Investments, Savings, etc.</i> (2,125 thousand yen)		<i>Financial Sources</i> (2,125 thousand yen)
Increase in current assets inventory, etc. (Y 22 thousand)	} {	Liabilities (borrowings) (Y 150 thousand)
Net increase in current assets (savings) (Y 1,023 thousand)	} {	Depreciation reserve (Y 771 thousand)
Investments in fixed capital (Y 1,062 thousand)	} = {	Farm household economy surplus (Y 873 thousand)
Amount unaccounted for (Y 18 thousand)	} {	Income from sale of fixed assets (Y 331 thousand)

SOURCE: The Ministry of Agriculture, Forestry and Fisheries, "Farm Household Economy Survey".

and income from sale of fixed assets (mainly the land) amounting to 1,100,000 yen and borrowings totalling 150,000 yen.

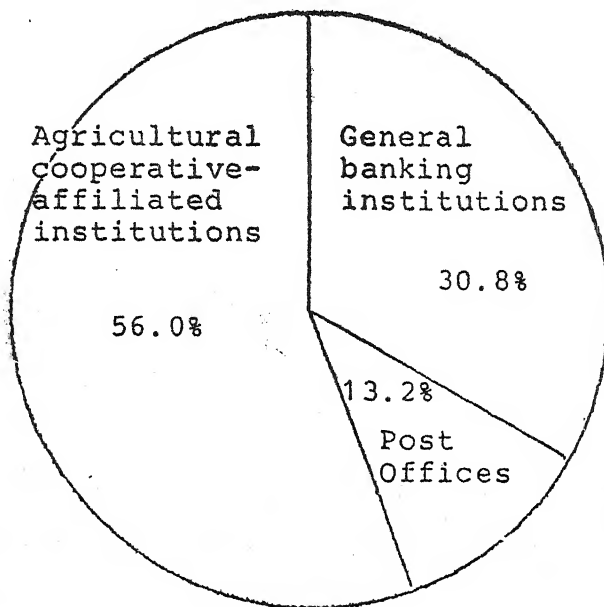
- (b) As to the financial institutions in which the farmers have their savings deposited or from which they obtain loans, the fiscal 1980 statistics show that the financial organs affiliated with the agricultural cooperatives accounted for 56 per cent in the case of savings and 51 per cent in the case of borrowings (see Chart 3, p. 187).

## II. INSTITUTIONAL FINANCING

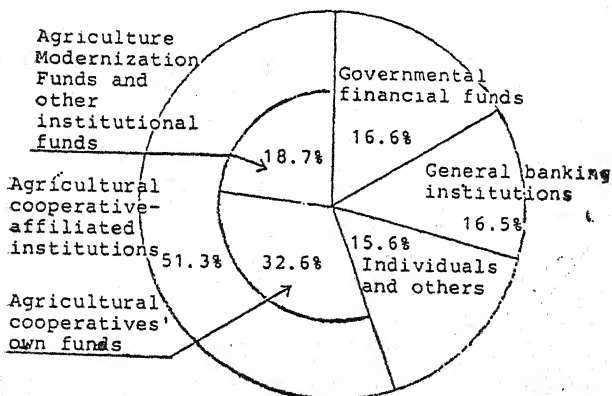
### *Outline of Institutional Financing*

- (a) As a result of various measures taken by the government, including those to establish new financing systems and to expand the existing financing quotas, the amount of loans from the institutional funds of the government kept on increasing each year (see Chart 4, p. 189). In fiscal 1977 and thereafter, the annual amount of such loans grew into a scale exceeding the 1 trillion mark. In

**CHART 3 FINANCIAL INSTITUTIONS IN WHICH FARMERS MAKE THEIR SAVINGS AND DEPOSITS (END OF FY 1980)**



**FINANCIAL INSTITUTIONS FROM WHICH FARMERS OBTAIN LOANS (END OF FY 1980)**



**SOURCE:** The Ministry of Agriculture, Forestry and Fisheries, "Farm Household Economy Survey".

fiscal 1978, however, the yearly growth of loans from the institutional funds began slowing down. In fiscal 1978, the amount hovered almost on the same level as that of the preceding year and its growth remained minimal both in fiscal 1979 and 1980.

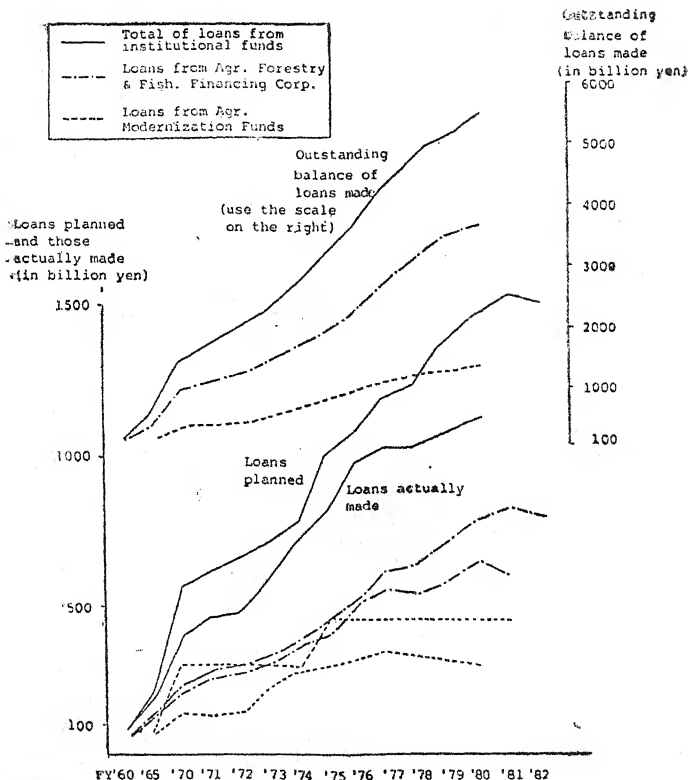
- (b) The outstanding balance of loans from the institutional funds exceeded 3 trillion yen in 1975 and this figure jumped to 5,780.1 billion yen in fiscal 1980. Of this total, the amount from the Agriculture, Forestry and Fisheries Finance Corporation's funds was 3,881.1 billion yen (67% of the entire amount of loans from the institutional funds) and that from the Agriculture Modernization Fund, 1,329.4 billion yen (23%).

Thus the loans from the above mentioned two sources accounted for 90 per cent of the entire amount of loans made from institutional funds.

#### *Agriculture, Forestry and Fisheries Finance Corporation's Funds*

- (a) The Agriculture, Forestry and Fisheries Finance Corporation was established in 1953 and has been operating ever since with the purpose of "providing the farmers, forest operators and fisheries operators, as well as their organizations, with financing in long-term and low-interest loans to assist them in maintaining and enhancing their productivity, such loans being those which the Central Cooperative Bank for Agriculture and Forestry or the general commercial banks have difficulties in providing".
- (b) While the Agriculture, Forestry and Fisheries Finance Corporation's funds may be categorized in various ways, they are normally divided into 34 categories (of which 14 are those related to agriculture) and their conditions for loans have been prescribed in accordance with the character of each category of funds.
- (c) The amounts of loans which the above mentioned Corporation decides to provide have rapidly increased along with the measures taken to improve and expand the system (see Table 2). The annual increase in the total amount loaned out by the Corporation, however, has

CHART 4 AMOUNTS OF LOANS MADE FROM INSTITUTIONAL FUNDS



Source: Finance Division of the Ministry of Agriculture, Forestry & Fisheries

**NOTE:** Each of the outstanding balance of loans shown above is that recorded at the end of the fiscal year concerned (March of the following year), with the exception of those for the Agriculture Modernization Funds, Natural Disaster Rehabilitation Funds and the Fisheries Modernization Funds, for which figures as at the end of December of the years concerned were given.

somewhat been slowing down in its growth in recent years, with the exception of the fiscal years 1980 and 1981 when Japan suffered damages from unusual cold

TABLE 2 THE PLANNED, THE ACTUAL AND THE OUTSTANDING AMOUNTS OF LOANS  
FROM THE AGRICULTURE, FORESTRY AND FISHERIES FINANCE CORPORATION

(Unit: in 100 million yen)

(Loans)	FY '65	'70	'75	'76	'77	'78	'79	'80	'81
			(4,430)	(5,110)	(6,130)				
Planned	1,240	2,300	4,330	4,910	5,570	6,320	7,170	7,690	7,970
Actual	1,099	2,117	4,053	5,022	5,586	5,459	5,792	6,603	6,136
Outstanding Balance	4,559	10,019	20,309	23,632	27,556	31,015	34,651	38,811	42,615

NOTE: Figures in the brackets in the '75, '76 and '77 columns are the revised amounts.

TABLE 3 THE AMOUNTS ACTUALLY LOANED FROM AGRICULTURE-RELATED FUNDS, BY CATEGORY  
(Unit: in 100 million yen, %)

(Categories)	FY '65	'70	'75	'76	'77	'78	'79	'80	'81	Ratio (%)
Land improvement	346	699	1,526	1,732	2,081	2,337	2,426	2,382	2,368	53.8
Comprehensive facilities,	—	161	400	520	580	436	418	404	402	9.1
farmlands, etc.										
Acquisition of unclaimed lands	244	410	455	503	568	441	495	558	654	14.9
Maintenance of owner-farmers	90	95	126	467	86	91	200	873	536	12.2
Joint-use facilities	37	34	84	68	93	82	139	89	66	1.5
Others	107	156	288	329	342	350	366	373	373	8.5
TOTAL	824	1,555	2,878	3,619	3,750	3,737	4,044	4,679	4,399	100.0

weather.

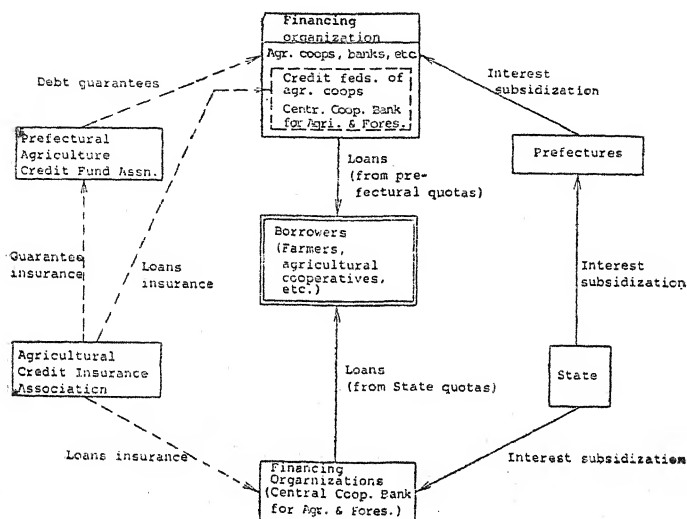
Of the entire amount of funds that the Corporation decides to provide in a given year, those directed to agriculture account for about 70 per cent, of which the funds for land improvement account for about 50 per cent, followed by the funds for acquisition of farmlands and unreclaimed lands and then by those for maintenance of owner-farmer operations, each accounting for a little over 10 per cent (see Table 3).

### *Agriculture Modernization Funds*

How the system has been developed and how it functions is given below:

- (a) The system of Agriculture Modernization Funds was inaugurated in fiscal 1961 with the purpose of making full use of the funds available from agricultural cooperatives and their affiliated financial institutions and to assist the farmers, etc., in strengthening their capital equipment and modernizing their operations (see Chart 5, p. 193).
- (b) The Agriculture Modernization Funds have their financial sources in commercial funds, such as those of the agricultural cooperative-affiliated financial institutions and commercial banks; about 98 per cent comes from such financial institutions as those affiliated with the agricultural cooperatives and credit federations of agricultural cooperatives. And to such financing, interest subsidies are normally provided at the annual rate of 3 per cent in the case of individuals (1 per cent for joint-use projects). Such interest subsidies are granted by prefectural governments but one-half of them are provided by the state (the interest subsidies for the funds from the Central Cooperative Bank for Agriculture and Forestry are provided directly by the state).
- (c) Financing from the Agriculture Modernization Funds is provided to practically all types of agricultural facilities and projects excepting land acquisitions. However, because of the nature of the funds which have their source in private funds, these Agriculture Modernization Funds,

CHART 5 STRUCTURE OF AGRICULTURAL MODERNIZATION FUNDS SYSTEM



as compared with the funds from the Central Cooperative Bank for Agriculture and Forestry, take on little policy-oriented features. Hence their interest is somewhat high and the redemption period comparatively short.

- (d) The credit ceiling for financing from the Agriculture Modernization Funds has been steadily raised along with the increase in demand for funds. The credit ceiling that started out with 30 billion yen jumped to 100 billion yen in fiscal 1968, to 300 billion yen in 1969, and then to 450 billion yen as from fiscal 1975 (see Table 4). The annual total of loans actually made and that of the outstanding balance of loans have been rising sharply. Since the mid-1970s, however, the growth in the increase of loans from these Funds began slowing down; throughout the four consecutive fiscal years from 1978 to 1981, the total amount of loans of each year was lower than that of the preceding year.

TABLE 4 THE PLANNED, THE ACTUAL AND THE OUTSTANDING BALANCE OF LOANS  
MADE FROM THE AGRICULTURE MODERNIZATION FUNDS

(Unit: in 100 million yen)

(Loans)	FY '65	'70	'75	'76	'77	'78	'79	'80	'81	'82
Planned	700	3,000	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
Actual	590	1,352	2,994	3,208	3,390	3,328	3,206	3,043	2,914	—
Outstanding Balance	1,611	4,120	8,817	10,216	11,458	12,196	12,894	13,294	13,475	—

SOURCE : Finance Division, the Ministry of Agriculture, Forestry & Fisheries.

NOTE : Figures given for the 'Outstanding Balance' are those as at the end of December.

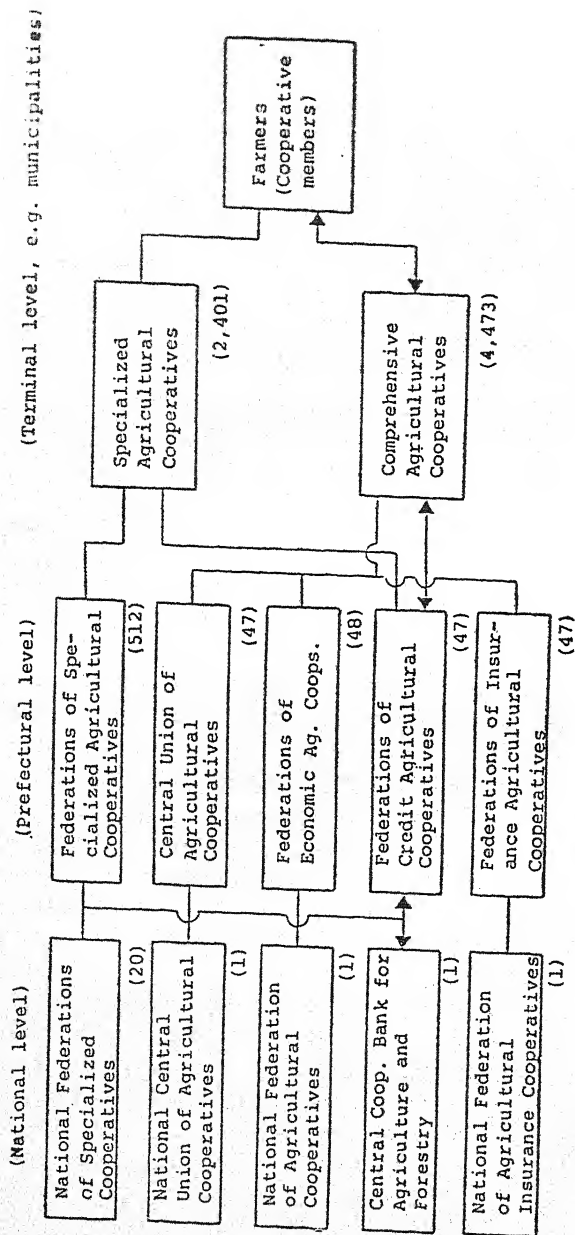
### III. FINANCING FROM AGRICULTURAL COOPERATIVE- AFFILIATED FINANCIAL INSTITUTIONS

#### *System of Agricultural Cooperative-affiliated Financial Institutions*

(a) The system consists of three levels: the agricultural cooperatives, the prefectural federations of agricultural cooperatives and the national federation of agricultural cooperatives (see Chart 6, p. 196). The agricultural cooperatives, which are the terminal organs of the system, come in two types: the comprehensive cooperatives and the specialized cooperatives. The former conducts various kinds of services such as selling, buying, mutual insurance and guidance, in addition to credit-giving services (savings and loans), while the latter does not offer any service in savings. The prefectural federations of agricultural cooperatives comprise various different types, such as, the federations of credit agricultural cooperatives, federations of economic agricultural cooperatives, central unions of agricultural cooperatives and federations of specialized agricultural cooperatives. And all of these organizations are linked with their respective national central organs.

(b) Whereas the agricultural cooperatives and the credit federations of agricultural cooperatives are agricultural finance organisations established under the Agricultural Cooperatives Act, the Central Cooperative Bank for Agriculture and Forestry is the central financial institution established under the Act for Central Cooperative Bank for Agriculture and Forestry. Consisting of organisations of farmers, forest operators and fisheries operators, this Bank serves the entire agricultural, forestry and fisheries industries.

The Central Cooperative Bank for Agriculture and Forestry was established in 1923 under the name of a Central Bank for Industrial Cooperatives through investments made by the government, the industrial cooperatives and the federations of such cooperatives. In 1943, it was renamed the Norin Chuo Kinko (Central Cooperative Bank for Agriculture and Forestry) and in 1959 the government investment into this Bank was brought to



NOTES: 1. The marks ← show the affiliation of credit agricultural cooperatives.

2. The numbers given in ( ) for agricultural cooperatives are those of the investing cooperatives only. Besides these there are 35 investing general agricultural cooperatives which do not handle loan business and 2,713 non-investing cooperatives.

3. While there are 755 federations of agricultural cooperatives which are not 'national' federations, the numbers shown in ( ) are those of the investing federations only.

nil. Since then, it has been operating as a private financial institution run only with investments from the member organisations.

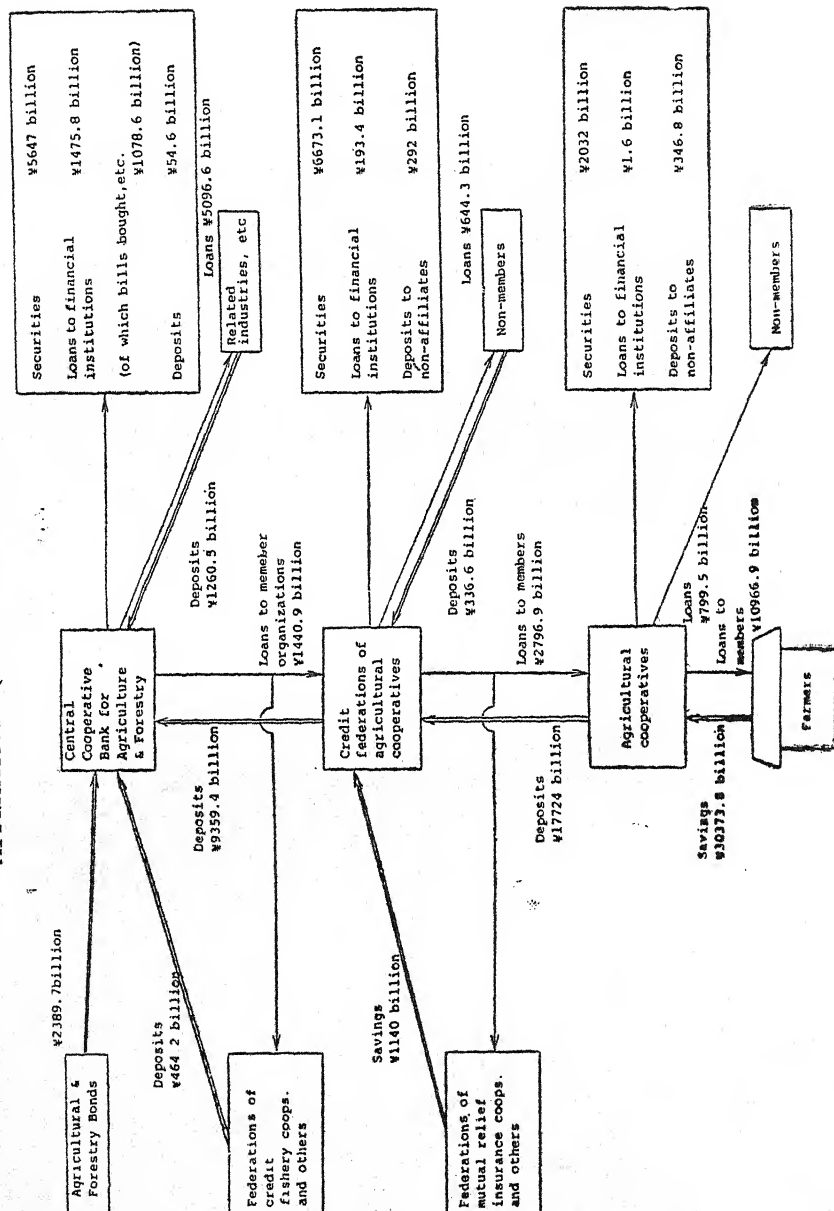
*Financing Activities and Flow of Funds on Various Levels of the System of Agricultural Cooperative-affiliated Organizations*

- (a) The agricultural cooperatives, using the savings of members, etc., as source of funds, offer loans to their members, etc. (see Chart 7, at p. 198). The cooperatives deposit most of their surplus funds into the federations of credit agricultural cooperatives.
- (b) The federations of agricultural cooperatives, on their part, accept savings from the federations of mutual relief insurance agricultural cooperatives, economic federations, etc., as well as from the agricultural cooperatives, and using such savings as source of funds, offer loans to their member agricultural cooperatives and to related non-member corporations, etc., within the respective regions. The credit federations also lend surplus funds to local banks and other financial institutions and invest them into securities, etc., depositing the remainders in the Central Cooperative Bank for Agriculture and Forestry.
- (c) The Central Cooperative Bank for Agriculture and Forestry raises funds through acceptance of savings and deposits from the federations of credit agricultural cooperatives and other related organisations and also through issuance of agricultural and forestry bonds. Using such funds, the Bank provides loans to member organisations and related industries and, at the same time, holds securities as a means of utilising its surplus funds.

*Raising and Investment of Funds by Agricultural Cooperative-Affiliated Financial Institutions Operating on three Different Levels—an Overall View of the Activities of those Institutions as a Single Financial System*

- (a) Since the financial institutions affiliated with agricultural cooperatives often overlap one another in their financing activities, an accurate picture of how these institutions raise and invest their funds can only be obtained when

CHART 7 FLOW OF FUNDS THROUGH THREE LEVELS OF AGRICULTURAL COOPERATIVE AFFILIATIONS (as of the end of December 1981)



such activities could be observed as if they were conducted by a single financial system (see Table 5). The records, as seen from such a viewpoint, indicate that the total amount of funds handled by the agricultural cooperative-affiliated institutions has kept on increasing over the years; as at the end of March 1981, the amount of funds raised by all of the agricultural cooperative-affiliated financial institutions totalled 37,166.1 billion yen, of which 30,079.2 billion, or about 80 per cent, were funds from savings and deposits.

- (b) Of the above mentioned funds raised, a total of 12,662.4 billion yen or 34 per cent, was loaned to be used within the system of agricultural cooperative-affiliated financial institutions.
- (c) Among the activities conducted outside the system by the agricultural cooperative-affiliated financial institutions, the major ones are the holding of securities and investments of surplus funds such as loans to other financial institutions. These are followed, in terms of amount involved, by loans to related industries and those to non-members of agricultural cooperatives.

TABLE 5 TRANSITION OF MAJOR ACCOUNTS OF AGRICULTURAL COOPERATIVE-AFFILIATED FINANCIAL INSTITUTIONS, VIEWED AS IF THE INSTITUTIONS WERE OPERATING AS A SINGLE FINANCIAL SYSTEM (A TRIAL CALCULATION)

(Unit: in 100 million yen, %)

Categories	Outstanding Balance as at the end of					Ratio (1980)
	FY 1975	1976	1977	1978	1979	
(Funds)						
Savings and deposits	170,669	195,102	220,870	248,448	275,776	300,792 80.9%
Bonds issued	13,465	15,670	16,099	17,762	20,092	22,454 6.0
Investments, etc.	18,640	22,785	26,524	31,879	38,393	48,415 13.0
Total of funds and investments	202,804	233,557	263,493	298,089	334,261	371,661 100.0
(Investments)						
Loans:	112,968	119,111	120,824	119,839	129,292	141,255 38.0
to members	98,733	105,230	107,706	107,573	116,004	126,624 34.1
to non-members	14,235	14,051	13,118	12,266	13,288	14,631 3.9
Loans to related industries, etc.	19,734	23,164	27,744	32,287	39,127	44,916 12.1
Surplus funds	51,050	69,696	90,115	117,495	133,055	145,920 39.3
Cash and others	19,032	21,416	24,810	28,468	32,787	39,570 10.6

NOTES: 1. Excluding the loans commissioned by the Central Cooperative Bank for Agriculture and Forestry.

2. The above are major accounts calculated on the assumption that the agricultural cooperative-affiliated financial institutions, which operate on three levels, were a single financial system.

3. The surplus funds include deposits, money in trust, loans to financial institutions and securities.

